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MACKENZIE VALLEY PIPELINE INQUIRY

Government  
Publications

IN THE MATTER OF APPLICATIONS BY EACH OF  
(a) CANADIAN ARCTIC GAS PIPELINE LIMITED FOR A  
RIGHT-OF-WAY THAT MIGHT BE GRANTED ACROSS  
CROWN LANDS WITHIN THE YUKON TERRITORY AND  
THE NORTHWEST TERRITORIES, and  
(b) FOOTHILLS PIPE LINES LTD. FOR A RIGHT-OF-WAY  
THAT MIGHT BE GRANTED ACROSS CROWN LANDS  
WITHIN THE NORTHWEST TERRITORIES  
FOR THE PURPOSE OF A PROPOSED MACKENZIE VALLEY PIPELINE  
and

IN THE MATTER OF THE SOCIAL, ENVIRONMENTAL AND  
ECONOMIC IMPACT REGIONALLY OF THE CONSTRUCTION,  
OPERATION AND SUBSEQUENT ABANDONMENT OF THE ABOVE  
PROPOSED PIPELINE

(Before the Honourable Mr. Justice Berger, Commissioner)

Yellowknife, N.W.T.

March 26, 1976.

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PROCEEDINGS AT INQUIRY

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Volume 136

CANADIAN ARCTIC  
GAS STUDY LTD.

APR 9 1976

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APPEARANCES:

Mr. Ian G. Scott, Q.C.,  
Mr. Stephen T. Goudge,  
Mr. Alick Ryder and  
Mr. Ian Roland for Mackenzie Valley Pipeline  
Inquiry;

Mr. Pierre Genest, Q.C.,  
Mr. Jack Marshall, and  
Mr. Darryl Carter for Canadian Arctic Gas  
Pipeline Limited;  
Mr. Reginald Gibbs, Q.C.,  
Mr. Alan Hollingworth &  
Mr. John W. Lutes, for Foothills Pipe Lines Ltd.;

Mr. Russell Anthony &  
Pro. Alastair Lucas for Canadian Arctic Resources  
Mr. Garth Evans Committee;

Mr. Glen W. Bell and  
Mr. Gerry Sutton, for Northwest Territories  
Indian Brotherhood, and  
Metis Association of the  
Northwest Territories;

Mr. John Bayly  
or  
Miss Leslie Lane for Inuit Tapirisat of Canada,  
and The Committee for  
Original Peoples Entitle-  
ment;

Mr. Ron Veale and  
Mr. Allen Lueck for The Council for the Yukon  
Indians;

Mr. Carson H. Templeton, for Environment Protection  
Board;

Mr. David Reesor for Northwest Territories  
Association of Municipal-  
ities;

Mr. Murray Sigler for Northwest Territories  
Chamber of Commerce.

Mr. John Ballem, Q.C., for Producer Companys;

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1 Yellowknife, N.W.T.

2 March 26, 1976.

3 (PROCEEDINGS RESUMED PURSUANT TO ADJOURNMENT)

4 THE COMMISSIONER: Well, we'll  
5 come to order, ladies and gentlemen.

6 Before Dr. Sprague takes the  
7 stand again I should rule on the evidence that is  
8 sought to be introduced. COPE proposes to call a panel  
9 of four witnesses to present a series of case studies  
10 to show what they say has been a failure by government  
11 and by industry to consult with the native people about  
12 industrial development in the past.

13 Arctic Gas and Foothills say  
14 this evidence is not relevant. They argue that in any  
15 event the Inquiry has, at the community hearings, heard  
16 many complaints from the native people that industry  
17 has been allowed to proceed without regard to native  
18 rights and native interests. Therefore they say there  
19 is no need to hear further evidence on the point.

20 I am going to hear the  
21 evidence of the panel.

22 What we are trying to do at  
23 this Inquiry is to figure out what the impact (social,  
24 environmental and economic) will be of pipeline devel-  
25 opment, and of all that it will bring with it. I am  
26 told that the evidence of these witnesses will reveal  
27 what the impact has been when industrial development  
28 has occurred in the past.

29 We have held hearings in the  
30 Inuit communities of the Western Arctic. Now





1 COPE which represents the Inuit people, says that they  
2 want to call witnesses at the formal hearings who will  
3 discuss the implications of what they say has been  
4 a failure by government and by industry to consult with  
5 the native people in any meaningful way.

6 I am not interested in  
7 thrashing old chaff. We are seeking to develop construc-  
8 tive approaches to future development , not to appor-  
9 tion blame for any past failures.

10 But we can learn from what  
11 has happened in the past. This evidence appears to  
12 be likely to help us to develop constructive approaches  
13 for the future.

14 COPE's case is that the  
15 settlement of native land claims must precede development.  
16 That, they say, is the essential condition. They say,  
17 that notwithstanding the determination by the govern-  
18 ment to let the native people in on the making of  
19 decisions, notwithstanding the undertakings that  
20 industry may give, and notwithstanding any recommenda-  
21 tions this Inquiry may make, the native people will  
22 never have any control over what will happen to them,  
23 to their villages and to the land they claim, unless  
24 they achieve a measure of control over the development  
25 of the north. The only way they will acquire that  
26 measure of control, they say, is through the achievement  
27 of their land claims.

28 I am to advise the government  
29 what terms and conditions should be imposed if the  
30 pipeline is to be built. But there is no point in





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1 making recommendations if they are not likely to be  
2 efficacious. So it is important to know what can be  
3 done to carry the Inquiry's recommendations into effect.

4 COPE is saying that any re-  
5 commendations of this Inquiry relating to the pipeline  
6 project will not, even if the government finds them  
7 acceptable, and even if the industry goes willingly  
8 along with them, be carried through unless the native  
9 people are in a position to insist upon it; they  
10 will only be in that position if their land claims  
11 are settled; the experience of the past, they say,  
12 proves it.

13 I think I should listen to  
14 the evidence in support of this contention.

15 Before we return to Dr. Sprague  
16 is there any reason for the environmental panel being  
17 recalled to the stand?

18 MR. MARSHALL: Yes sir, I had  
19 one question to put of Mr. Hemstock in re-direct.  
20 In addition, the panelists wish to respond to the  
21 request of Mr. Scott that they examine the Scott route  
22 which is set out on these maps, and they would like  
23 to provide some comments now while they're here.

24  
25 DONALD DABBS,  
26 WILLIAM W.H. GUNN,  
27 FRANK BANFIELD,  
PETER J. MCCART,  
RONALD JAKIMCHUK,  
28 ALEXANDER HEMSTOCK, resumed:

29 RE-EXAMINATION BY MR. MARSHALL:

30 Q If I may, sir, I'd like  
to call Mr. Hemstock first to deal with the question





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1 and the other members of the panel, except Mr. Webb,  
2 who has no comment on the Scott route, if I may call  
3 it that.

4 THE COMMISSIONER: Well, I  
5 think we should do that. Well, gentlemen -- yes?

6 MR. SCOTT: Mr. Commissioner,  
7 I understand that the panel may want to make a comment  
8 on the route. I think that would be useful but I  
9 don't know about the others, but we wouldn't propose  
10 to cross-examine them at this time. I was forced to  
11 go to a wine and cheese party last night and consequently  
12 I was unable to prepare.

13 MR. HOLLINGWORTH: Somebody  
14 even took his microphone from him.

15 THE COMMISSIONER: Well,  
16 gentlemen of the panel, maybe you would come back.  
17 Mr. Webb, you might as well, if you are here, join  
18 the panel.

19 MR. MARSHALL: Q Mr. Hemstock,  
20 you were cross-examined yesterday by Mr. Hollingworth  
21 and Commission counsel, Mr. Scott, with respect to  
22 your opinion as to the relative impacts on the  
23 environment of the cross-delta route and what's been  
24 described as the circum-delta route, and the basis  
25 for your opinion. Specifically you were asked if the  
26 advice that was given by the various consultants to  
27 Arctic Gas, and whether their advice had favored the  
28 cross-delta route or the circum-delta route. You were  
29 asked about the opinions expressed by the various  
30 consultants with the exception of Dr. Banfield, and I





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1 was wondering, sir, whether you had received advice  
2 from him?

3 WITNESS HEMSTOCK: Yes, I have  
4 received advice from Dr. Banfield on the overall  
5 environmental impact, and I believe that he has covered  
6 that in his direct testimony and finds that there is  
7 a slight overall advantage to the cross-delta route.  
8 In addition, of course, I neglected to mention that I have  
9 people on my staff, Dr. Gossen for instance, who also  
10 finds the slight advantage for the cross-delta route,  
11 and Mr. Ray Glasrud, who is the manager of Environmental  
12 Research for Northern Engineering who has come to the  
13 same conclusion.

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1 Q Yesterday, Mr. Scott  
2 proposed at the end of his cross-examination that the  
3 panel consider and Arctic Gas consider a route that's  
4 set out on five map sheets that are on the wall behind  
5 you. Have they been marked as an exhibit Mr. Scott?

6 MR. SCOTT: I don't<sup>think</sup> they have  
7 and perhaps they should be Mr. Commissioner.

8 THE COMMISSIONER: All right,  
9 well that map will be the next exhibit.

10 MR. MARSHALL: Mr. Jakimchuk,  
11 could you comment on the route outlined on that map?  
12 Perhaps just before you do, I have to get some  
13 clarification from Mr. Scott.

14 Mr. Scott, do you consider  
15 it as all one route or in the sense that the section  
16 across Shallow Bay is an integral part of it or do  
17 you want them dealt with separately?

18 MR. SCOTT: What we really  
19 intended was that it should be dealt with separately.  
20 That is, we've canvassed the alternatives beginning,  
21 as you approach the delta this week and really what we were  
22 asking the panel to zero in on was the Yukon coastal  
23 proposal.

24 MR. MARSHALL: Well gentlemen,  
25 if you could deal then with the Yukon coastal portion  
26 of that route and make the assumption that there is no  
27 change required in Alaska. Was that what I'm to  
28 understand Mr. Scott?

29 MR. SCOTT: Yes.

30 MR. MARSHALL: That's the





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1 basis that we took it upon.  
2

3 MR. SCOTT: The fundamental  
4 assumption of the route is that it utilizes the Dew Line  
5 sites.  
6

7 MR. MARSHALL: Well, I think  
8 inasmuch as we don't know whether or not that's  
9 feasible, we'll have to ask them to consider it on  
10 the basis that (a) it might make use of the Dew Line  
11 sites for compressor stations, and, (b) it would not  
12 be possible to use the Dew Line sites in order to have  
13 a hydraulically balanced line because they have different  
14 opinions, as I understand in my discussion with the  
15 panel, depending on whether or not one is the case, or  
16 the other is the case.  
17

18 MR. SCOTT: Well, Mr. Commission-  
19 er that's perhaps why an engineering comment on it  
20 would be more useful first but the essential characteris-  
21 tic of the scheme is that it utilizes areas that are  
22 already disturbed for compressor plants and airports  
23 and whatever else is required. It seems to me that that  
24 is a fundamental characteristic of the proposal which  
25 can't be overlooked when examining it.  
26

27 MR. MARSHALL: Well, if I may  
28 sir, I'll ask them to deal with it on the assumption that  
29 there are no changes in Alaska and the use of the Dew  
30 Line sites for compressor stations can be made, but I'll  
31 ask them then to also say whether that opinion would  
32 remain the same if the Dew Line sites could not be  
33 utilized because this is anticipatory of something that





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1 might develop in the future. I want to discuss that  
2 with you when this panel has finished their remarks  
3 on it.

4 THE COMMISSIONER: Well,  
5 Mr. Williams was asked about using those sites and  
6 he said that the difficulty was that apart from considera-  
7 tions of achieving appropriate compression at suitable  
8 intervals that you had to cross the fans of all  
9 the rivers of the North Slope, and that that created  
10 problems. But, we're leaving that out.

11 MR. SCOTT: Well, I think sir  
12 when Mr. Williams approached the <sup>problem</sup>, he approached  
13 it as if the existing route was to be amended by the  
14 utilization of the Dew Line sites and that obviously  
15 causes difficulty because the Dew Line sites are --  
16 I forget how far -- but ten or 12 miles in some cases  
17 remote from the existing proposed line. We thought  
18 that it was unfair, as I'm sure he would, that it had  
19 to be considered in that way. It occurred to us that  
20 if you began on the proposition that you were going to  
21 use the Dew Line sites, you would perhaps elect a  
22 different route and that's why we prepared a drawing  
23 of that type.

24 Incidentally, I think there  
25 are two fans that we're talking about that are shown  
26 on the map and to which, as you say sir, Mr. Williams  
27 referred.

28 MR. MARSHALL: Both Mr.  
29 Carter and I recall Mr. Williams dealing with it both  
30 ways, either right along the coast or not. Perhaps we





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1 could just proceed and I could put the questions to  
2 the panel and we'll see if this provides the information  
3 Mr. Scott seeks.

4 THE COMMISSIONER: But, now,  
5 before you do that, where does that thing cross Shallow  
6 Bay?

7 MR. MARSHALL: With the Barry  
8 route. Is that correct Mr. Scott?

9 MR. SCOTT: Yes, but I would  
10 ask if it's possible for the panel to consider the  
11 Yukon Slope -- the Yukon coast route in isolation. It  
12 can obviously hook into either prime Shallow Bay route  
13 or the Barry - Shallow Bay route.

14 MR. MARSHALL: Thank you Mr.  
15 Scott. Mr. Jakimchuk --

16 THE COMMISSIONER: Excuse me,  
17 just so that we all understand this because if this  
18 comes up again, I want it understood. The prime route  
19 is that thing in red. The next route is the Barry route  
20 and the route below that is the southern route or if  
21 we have to give it somebody's name, the Gunn route.  
22 Now that's where we're at and that map that Dr. McCart's  
23 looking at, is the Barry route. All right, is everybody  
24 with me?

25 MR. SCOTT: Mr. Commissioner,  
26 if we're going to have nomenclature, I don't think  
27 that's satisfactory. If you look at the map on the  
28 right, the red route is the prime route. The second  
29 lower is the Barry route. The third is a nameless route  
30 and I -- perhaps Dr. Gunn will allow it to bear his



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1 name for the moment. If you look at the map on the  
2 left, -- first of all, just look at the left half  
3 of it. That is the Yukon coastal portion before we  
4 get to the delta. That I would propose to call the  
5 Dew Line route. That's its fundamental premise. It  
6 can hook into either one of the main line cross-delta,  
7 the Barry cross-delta or the Gunn route, though the  
8 line that is in fact shown on it is the Barry route.

9 THE COMMISSIONER: All right,  
10 we'll call that the Gunn route, always understanding  
11 that Dr. Gunn still prefers the circum-delta route,  
12 as I'm sure Dr. Barry does too.

13 (MAP SHOWING DEW LINE ROUTE MARKED AS EXHIBIT 517)  
14  
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Dabbs, Gunn, Banfield, McCart,  
Jakimchuk, Hemstock  
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1 MR. MARSHALL: Mr. Jakimchuk  
2 having regard to the DEW Lineroute that Mr. Scott has  
3 had laid out on these maps, could you comment if you  
4 would sir on the impact that you could see on mammals,  
5 and your preferences for such a route as compared with  
6 the Arctic Gas route, and you are to assume that there  
7 is no change required in Alaska.

8 WITNESS JAKIMCHUK: Okay. The  
9 in doing a cursory assessment of that, I would like to  
10 approach it Mr. Marshall in the way of pros and cons,  
11 rather than to attempt to give an explicit opinion.  
12 There are two major considerations from a mammalogical  
13 standpoint. One is the Arctic fox, the other is the  
14 Porcupine caribou herd. In terms of the caribou I  
15 see that as a pro -- a more northerly alignment as a  
16 pro factor, in as much as the alignment would be  
17 removed -- further removed, from major movements and  
18 calving than it is at the present time.

19 I see a disadvantage in terms  
20 of Arctic fox, particularly in the area of the deltas  
21 of the Malcolm and the Firth Rivers, which represent  
22 the most important Arctic fox denning habitat on the  
23 North Slope, and I would refer as for documentation  
24 of that to volume 9 of the Biological Report series,  
25 figure 1, between pages 14 and 15, which shows the  
26 ditribution of Arctic and colored fox den sites along  
27 the North Slope, and becomes readily apparent that the  
28 new routing impinges upon that species.

29 I should leave it at that  
30 because I feel that those are the two major consideration,





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1 and the one is a slight pro on behalf of the caribou,  
2 the other is a more significant con, I suppose, on  
3 behalf of the Arctic fox. And in as much as this may  
4 be my last word, I would just like to say that I feel  
5 somewhat left out that I don't have a route named after  
6 myself, Mr. Marshall.

7 Q Dr. McCart, would you care  
8 to comment?

9 WITNESS MCCART: There's a  
10 fair amount of information available, for this DEW Line  
11 route, and I'll just quickly summarize some of the  
12 pros and cons. First of all the DEW Lineroute would  
13 be downstream of most of the water sources, the groundwater  
14 sources that are important as overwintering areas, and  
15 therefore it would reduce this problem that we've  
16 discussed of the interception of groundwater flows,  
17 upstream of springs inhabited by fish. It would be  
18 downstream for instance of the -- or could be placed  
19 at least downstream of both the Firth River springs,  
20 the Firth-Malcolm spring, the one that lies between  
21 the two deltas, and the major spring on the Malcolm  
22 itself. It could also be I suppose, routed downstream  
23 of the more -- downstream of the two springs on Fish  
24 Creek.

25 It's also downstream of most  
26 of the important rearing areas for grayling across the  
27 slope. However it does pass through the lower ends  
28 of many of the streams across the Slope, in areas that  
29 are utilized by various species of whitefishes, and  
30 ciscos, during the course of the summer. Now we suspect



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Hickmuck, Hemlock  
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1 that these are fish which actually overwinter in the  
2 Mackenzie Delta, and utilize the lower portions of the  
3 stream such as the Blow River and the Babbage River as  
4 feeding areas during the summer. There might be some  
5 conflict in that situation. Again, it's also closer  
6 to the estuaries of rivers. The estuaries are also  
7 important feeding areas for anadromous fish which move  
8 along the coast during the course of the year, and  
9 there may be some possibility of interference as a  
10 result.

11 On balance however, I would  
12 say that there's relatively little to chose between  
13 the two routes, and I see no marked preference between  
14 the prime route as described by Arctic Gas, and the  
15 DEW Line route.

16 MR. MARSHALL: Dr. Gunn?

17 WITNESS GUNN: Yes, Mr. Marshall.

18 At the present time we have no preference for either  
19 route against the other, but I would like to describe  
20 briefly some of the advantages and disadvantages as  
21 I see them. Taking the advantages of the DEWLine  
22 route, first of all the relocation of a compressor  
23 site from the plane onto the DEWLine sites, if this  
24 is possible, and it seems to be a lot of big ifs, would  
25 be a definite plus in our view, from the point of view  
26 of birds. Secondly, the movement of the line northward  
27 would eliminate the conflict with the line of rafter  
28 nests that lie south of the present prime route, and  
29 in some cases comes within the two and a half mile  
30 limit. Thirdly, the DEWLine route would largely lie





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1 north of the areas used by snowgeese during the staging  
2 period in the fall. Those as I see it are the three  
3 chief advantages.

4                   The principal disadvantage  
5 as we see it, is that as we have stated numerous times,  
6 the north coast is an intensively used migration route  
7 for many kinds of birds, and is also an important  
8 loafing and moulting area for many kinds of waterfowl  
9 and shore birds, so that we would visualize that the  
10 movement of the line close -- very close to the coast  
11 as it lies at present, would increase the pressure  
12 and the amount of traffic in this area, and we have  
13 serious concerns about that.





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1 One final point I would like  
2 to make is that if the line should then go on and  
3 cross the delta, it might be that the rearrangement of  
4 the compressor sites might require the relocation of  
5 the CD-08 site that we now have on the eastern fringe  
6 of the delta, and if that had to be moved back in  
7 the delta, we would consider that a negative point.

8 Q Yes sir, I think it  
9 perhaps ought to have been stated right at the outset  
10 that by making a major adjustment, as Mr. Scott has  
11 suggested with his proposed DEW Line, there may be  
12 requirements for major relocations of compressor  
13 stations, and that might put some of them back into  
14 locations where it is thought by consultants they  
15 ought not to be.

16 You mentioned to me as well,  
17 Dr. Gunn, that your opinion would not be the same if  
18 it were not possible to use the DEW Line sites as  
19 compressor station sites. Would you confirm that  
20 and explain your reasoning?

21 A Well, as I mentioned,  
22 I think that would be an important advantage, perhaps  
23 the principal advantage as has been stated, principal  
24 advantage for this route, and if it were not possible  
25 to locate the compressor sites there, then I think  
26 the route would lose a lot of its advantage.

27 Q Fine. Mr. Jakimchuk, is  
28 that a factor in your assessment?

29 WITNESS JAKIMCHUK: Certainly  
30 we have inspected the existing proposed sites for



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1 compressor stations, and I couldn't really -- there  
2 may be greater implications if new sites were chosen  
3 and we would have to take a close look at them before  
4 I could render an opinion on that.

5 Q Mr. Dabbs, could you  
6 express your opinion?

7 WITNESS DABBS: I suppose I  
8 can start off with one small plus that I can see, and  
9 that is having the route closer to the coast, the  
10 numbers of miles of snow road for hauling of equipment  
11 from staging sites on the coast would be definitely  
12 shorter. However, from a revegetation point of view  
13 I really want to simply restate that the primary objec-  
14 tive of revegetation as we see it is erosion control  
15 for the many reasons that people can identify, controlling  
16 erosion into streams and so forth. I believe that re-  
17 vegetation is one of the very basic environmental  
18 protection measures that either project proposes.

19 As we move the route closer  
20 and closer to the Arctic coast, it is my opinion that  
21 it becomes more and more or increasingly difficult  
22 to be confident of a successful revegetation program,  
23 either through seeding or through physical replacement  
24 of the native plant material. Seeding difficulties,  
25 as identified in the report circulated this past  
26 week, closer to the coast, the success and degree is  
27 reduced due to the cooler soils, the inclement weather,  
28 closer to the Arctic coast. The problem of re-establish-  
29 ing native material found right on the right-of-way  
30 is one of a change in plant communities closer to the





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1 coast where we find plant materials which are not  
2 suitable for physical replacement.

3 Another strong disadvantage  
4 that I see, is that closer to the coast the route would  
5 cross the wider delta fans of both current and former  
6 river systems. This then imposes an additional erosion  
7 problem of wind erosion which really has not, in our  
8 opinion, been a serious problem to this point. A DEW  
9 Line route, I believe, would then impose this as  
10 another consideration. As shown in, I believe it's  
11 plate 45 of Volume 1 of the Biological Report series,  
12 an example of the type of soils and vegetation in the  
13 delta of the Firth River, where naturally there is  
14 expanses of areas that are not stabilized by plant cover  
15 due to wind erosion blowouts, and by building a pipeline  
16 across many miles of both the Firth and the Malcolm  
17 River deltas, I believe we can add that one more  
18 component to an already difficult enough assignment to  
19 stabilize the pipeline right-of-way.

20 In summary, I'd say that  
21 in all the choices that we've been given over the years  
22 of routes, either interior, either coastal, west side,  
23 east side of the Mackenzie and so forth, I've never had  
24 a real strong feeling on it because I believe that  
25 in each case we could solve the particular problems there  
26 are pros and cons to each. But frankly, this  
27 near coastal route or DEW Line route, I do feel quite  
28 strongly that it does make it very, very difficult  
29 to be sure of a stable plant cover.

30 Q Thank you, Mr. Dabbs.





Dabbs, Gunn, Banfield  
McCart, Jakimchuk, Hemstock  
Re-Examination

1 Dr. Banfield, do you have anything to add?

2 WITNESS BANFIELD: My main  
3 concern is that we don't leave the impression at this  
4 hearing that a final route proposal for such a route  
5 as the DEW Line can be made on the basis of such a  
6 superficial examination as has been conducted now. I  
7 recall actually that that actual route was discussed in  
8 1971, at about this level, and a number of the concerns  
9 that have been mentioned today were mentioned at that  
10 time. I'll add another one which hasn't surfaced yet,  
11 that is the problem of actual coastline erosion.

12 I recall about 20 years ago  
13 there was a grave west of Shingle Bay -- Shingle Point of  
14 a couple of explorers, and it was starting -- the graves  
15 were being eroded into and I think you probably all  
16 recall they have <sup>to be</sup> / moved back a couple of hundred  
17 yards. I notice that they're starting to sneak up towards  
18 the coast again, so that the actual route along there  
19 is eroding quite rapidly and one, I'm sure, you couldn't  
20 use that actual route.

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Dabbs, Gunn, Banfield,  
McCart, Jakimchuk, Hemstock  
Re-Examination

1                   The -- at this point you can  
2 only mention concerns, and we've said there's environmen-  
3 tal concerns. One of the disadvantages of moving  
4 compressor stations to coastal sites would be the  
5 concern of the risk of fuel leaks. They would then  
6 reach the Beaufort Sea probably more rapidly or before  
7 they could be contained, and this would introduce a  
8 risk to marine fishes, birds, waterfowl, and also  
9 possibly marine mammals. It is only at this level of  
10 concern that we can discuss it at this point.

11                   Thank you.

12                   Q     Thank you, Dr. Banfield.

13                   M r. Hemstock, do you have any comments?

14                   WITNESS HEMSTOCK: I don't  
15 think I have much new to add. It is our information  
16 that the snow availability would be somewhat better  
17 along the coast. Snowfall is there earlier. Presumably  
18 it would be therefore slightly easier to build a snow  
19 road, and as Mr. Dabbs mentioned, we would be able  
20 to get onto the right-of-way more quickly.

21                   On the other hand I think  
22 that the water availability is poorer along the coast  
23 because the major sources we expect to use are some-  
24 what upstream. Mr. Dabbs mentioned the longer crossing  
25 of fans, and of course it's an important engineering  
26 concern and quite a problem.

27                   I would think on the other  
28 hand that there's probably somewhat easier access to  
29 gravel closer to the coast again, primarily from the  
30 fans, so that's sort of an offsetting factor.





Dabbs, Gunn, Banfield  
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Re-Examination

1 I should point out, too, and  
2 I'm sure you recognize that the DEW Line sites are  
3 proposed in several cases as the offloading sites for  
4 the present prime route, so that they will be utilized  
5 for that purpose.

6 MR. MARSHALL: Thank you, Mr.  
7 Hemstock.

8 Mr. Commissioner, the environ-  
9 mental panel has been able to respond to Mr. Scott's  
10 request that this route be examined. They have, as they  
11 have indicated, been able to make only a cursory examina-  
12 tion of it, and they have indicated a number of concerns  
13 with respect to either route and what the pros and  
14 cons would seem to be.

15 Now, sir, to take it beyond  
16 that and to do a detailed environmental analysis so as  
17 to firm up an opinion on the part of each one of them  
18 would require a very considerable amount of work,, and  
19 before that could be done, sir, there would have to be  
20 an enormous amount of engineering work done, and I'm  
21 thinking specifically of sufficient work to be able to  
22 hydraulically balance a line along that route so as to  
23 determine the locations of compressor stations, not only  
24 along the so-called DEW Line route, but also on the  
25 Barry route, what would this do to the location of  
26 compressor station CD-08 which has just recently been  
27 relocated so as to overcome a concern that Dr. Gunn had.

28 The point I'm trying to make,  
29 sir, is that what Mr. Scott has asked be done, he's  
30 asked even for details of costing, would require an



Dabbs, Gunn, Banfield  
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1 enormous amount of work and it seems to me, sir, that  
2 to go beyond the point that this panel has gone in  
3 addressing the concerns that they see is perhaps asking  
4 too much of them. At this point, what we have is  
5 simply a line drawn upon a map by Mr. Scott or one of  
6 his advisors, we don't know. We don't know whether this  
7 is a route that is being proposed as a coastal route  
8 and cross-delta route by Mr. Scott and his staff. We  
9 don't know what status it may have. But certainly it's  
10 not a route that is proposed to be built by Arctic  
11 Gas. That being the case, sir, we are very reluctant  
12 to undertake the detailed sort of analysis that would  
13 be required in order to enable these panelists and the  
14 technical people who would have to be involved to  
15 form an opinion as to which of the two routes, in their  
16 opinion, they would prefer.

17 MR. SCOTT: Mr. Commissioner,  
18 may I respond to that? I, of course, can't ask Arctic  
19 Gas to do any work that it either doesn't want to do  
20 or that it regards as uneconomic or inadvisable in the  
21 circumstances, and really the decision is up to Mr.  
22 Marshall. I'm not going to build the pipeline on any  
23 of these routes, the public will be glad to hear.  
24 Arctic Gas is, and the decisions have to be made by  
25 it and by Foothills, not by Commission counsel.

26 The reason this is put forward,  
27 is simply this. Obviously if it is recommended by  
28 one of the appropriate tribunals that the line should  
29 follow the interior route, the problems associated with  
30 the Yukon coast and the delta substantially disappear.





Dabbs, Gunn, Banfield  
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1 That is one option that is acceptable to Arctic Gas.

2 I gather that Arctic Gas -

3 THE COMMISSIONER: Excuse me,  
4 I missed something. In what eventuality do the  
5 problems disappear?

6 MR. SCOTT: Oh, we've heard a  
7 great deal from the environmental people about the  
8 problems associated with the Yukon coastal route and  
9 the delta.

10 THE COMMISSIONER: Right.

11 MR. SCOTT: And if the interior  
12 route is selected, then I gather that that's an  
13 acceptable option to Arctic Gas, though perhaps not  
14 the preferred one, no one has to worry about the  
15 problems of the Yukon coast and the delta to the same  
16 extent. They tend to disappear, and that option is  
17 clear. Arctic Gas has made it plain, I think it's  
18 made it plain, however, that it prefers the Yukon  
19 coastal route<sup>and</sup> the delta route, and that is its  
20 prime route. Each of the environmentalists, though  
21 saying that the route is acceptable, has highlighted  
22 concerns.

23 My observation is simply this,  
24 that if Arctic Gas continues to regard the coastal  
25 route and the delta route as its prime route, it seems  
26 to me that it's in the interests of the public as well  
27 as the company that alternatives along that prime route  
28 should be thoroughly and carefully examined. If they're  
29 not examined, that will be up to Arctic Gas and then  
30 the tribunals will be forced with a straight choice



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1 between the interior route and the existing prime route.  
2 I'm simply trying, and it will be up to Mr. Marshall  
3 in the last analysis, whether I succeed, to see whether  
4 there are other alternatives that may make the coastal  
5 route and the delta crossing more palatable than it  
6 now appears to be-- at least to some.





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Re-examination

1 If my friend is unable for  
2 economic reasons to engage in that exercise, I quite  
3 understand it and I can't press him, but I would have  
4 thought that it was in the public interest if Arctic  
5 Gas can bring itself to do it to look at it that way.

6 Now, in approaching the  
7 question of the DEW Line route, it may very well be  
8 that the first question to be considered is whether the  
9 DEW Line sites can be utilized in the way we described  
10 in engineering terms and in financial terms because,  
11 I take it from what the environmentalists have said  
12 that if the DEW Line sites are not utilized, then  
13 whatever virtues there are in the DEW Line route  
14 tend to disappear.

15 But, I would have thought that  
16 if the applicant advances as its prime route as against  
17 the interior route, a Yukon coastal delta crossing  
18 route; if that's the alternative to the interior  
19 route that it prefers. It would want to examine  
20 alternatives within that routing that may make it more  
21 satisfactory or more palatable.

22 However, that's up to Mr.  
23 Marshall, not me.

24 MR. MARSHALL: Well of course  
25 sir, there's no evidence from Commission Counsel, or  
26 indeed, anyone else, that this other route ought to be  
27 built; that it is preferable. There's merely a  
28 suggestion that it might be nice to make use of the  
29 DEW Lines sites.

30 This panel doesn't really seem



Dabbs, Gunn, Banfield  
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1 to think that there's a clear advantage to the DEW  
2 Line route such as would warrant all the additional  
3 extra work.

4 Now, if Mr. Scott is putting  
5 forward a case that there is such a clear advantage,  
6 it's a different matter.

7 MR. SCOTT: No, no no. I'm  
8 not, Mr. Commissioner doing that. I simply say it  
9 seems to me it might be unfortunate if we were restrict-  
10 ed to a choice between the interior route and the  
11 Yukon coastal cross-delta prime route as presently  
12 stiputlated. If those are the two alternatives, well  
13 those are the two alternatives and the choice will have  
14 to be made.

15 If, as I think there may be,  
16 there is a modification of one of those alternatives,  
17 that may make it, in environmental terms more palatable,  
18 it would be agreeable, I think, to know that, so that  
19 the choice could be fairer to the applicant.

20 MR. MARSHALL: Well I take  
21 it then that Mr. Scott is leaving it to us if we wish  
22 to pursue this matter further.

23 MR. SCOTT: Precisely. My  
24 staff hasn't the capacity to make the decisions that  
25 would have to be made.

26 THE COMMISSIONER: All right.  
27 Well, I think that discussion is at an end.

28 MR. MARSHALL: I think it is.  
29 If there are no questions of these witnesses, I know  
30 they are anxious to try to dash for the plane. If there





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1 are though, they'll stay.

2 THE COMMISSIONER: Any questions  
3 Mr. Scott?

4 MR. SCOTT: No sir.

5 THE COMMISSIONER: Well, I just  
6 have one. I hope you'll still be able to get the  
7 plane. Dr. Banfield, this whale alarm system -- is it  
8 designed to frighten the whales away or is it designed  
9 to tell people whales are in the vicinity or what?

10 WITNESS BANFIELD: No sir,  
11 it was to frighten the whales away. One could go to  
12 the aquarium at Stanley Park and record the sounds of  
13 a killer whale and then broadcast that underwater from  
14 the barge and you'd probably empty the immediate  
15 vicinity of white whales.

16 THE COMMISSIONER: All right.  
17 Well, let's --

18 MR. SCOTT: The trouble with  
19 that Mr. Commissioner, is we might then have some  
20 biologist coming forward saying that killer whales had  
21 been sited in Shallow Bay and it was a dangerous place  
22 to commence construction.

23 THE COMMISSIONER: Well, that  
24 would mean the letting of additional contracts to  
25 consultants, and there are some advantages I suppose  
26 in that procedure that -- well, that completes the  
27 evidence of this panel then, does it Mr. Marshall?

28 MR. MARSHALL: It does sir.

29 THE COMMISSIONER: Well,  
30 thank you very much gentlemen and we certainly enjoyed



Dabbs, Gunn, Banfield  
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Re- Examination

1 seeing you all again and hearing from all of you again,  
2 and this may well be the last time that you'll be  
3 testifying. I just want to thank all of you for  
4 your co-operation and for the help you've given us.

5 So, I hope you're able to get  
6 that aircraft and get back to the other important work  
7 that awaits you.

8 WITNESS GUNN: It's a pleasure  
9 to have been here.

10 (WITNESSES ASIDE)

11 THE COMMISSIONER: Excuse  
12 me, I've got a call I think I should answer so we'll  
13 take a five minute break.

14 (PROCEEDINGS ADJOURNED AT 10:15 A.M.)  
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J.B. Sprague  
In Chief

(PROCEEDINGS RESUMED PURSUANT TO ADJOURNMENT)

JOHN B. SPRAGUE, resumed:

THE COMMISSIONER: Mr. Sprague is ready for cross-examination.

MR. SCOTT: I think Mr. Marshall indicated that he was going to go first.

MR. MARSHALL: I thought he had some slides, Mr. Scott.

THE COMMISSIONER: Right.

A Mr. Commissioner, maybe this is for peripheral interest, but for better or for worse, you can judge the quality of research which goes into these water quality criteria. This research project is one that we're just finishing up now. It happens to be on oil refinery waste, and I just thought I'd take you through it so you can see how it's done.

The first stage is to bring in your oil refinery wastes and stick them into these storage tanks where it's cooled and recirculated and used for about four days, and if you're dismayed by the appearance of string and sealing wax there, I'd just say that normally these experiments will last a few months or maybe a year, and if for economic reasons you usually you usually build them yourself, and often they work better that way. Next.

The first experiment we did on this one, I might say that this was in relation to to government regulations which I said oil refinery waste which meets the government standards must not kill



J.B. Sprague  
In Chief

1 rainbow trout, but nobody knew anything about sublethal  
2 effects, so this is what we were doing, really the  
3 first study on sublethal effects of a good oil refinery  
4 waste.

5                   The first thing we did was look  
6 at the growth of trout, and we simply had different  
7 concentrations in each of those tanks, of oil refinery  
8 waste, and we grew trout in there, for about a month  
9 and a half, and we simply measured the effect of each  
10 concentration on the growth of trout. These are these  
11 tubs in here, washing machine tubs, which are very  
12 good experimental chambers. And you can see there are  
13 paddle wheels in here, making effluent go round and  
14 round. The fish have to swim under more or less normal  
15 circumstances, and I think the next one shows the fish.

16                   Yes, you can see the fish  
17 swimming away in there, being       very happy in their  
18 oil refinery waste. Next one.

19                   Well, we've found some effects  
20 of very high concentrations which I'm not at the  
21 moment allowed to mention, but a very high concentration,  
22 not only severely affected growth of fish, but it  
23 causes erosion of the fins, as you can see, so  
24 obviously this is too high; but we did find that a  
25 certain concentration, let's call it "X", didn't  
26 have any particular bad effects, and actually the  
27 oil people were rather pleased that it wasn't a very  
28 low concentration. Next one.

29                   So fair enough, we've done  
30 a growth experiment, but sometimes you can get fooled



J.B. Sprague  
In Chief

1 on this, so we wanted to do this life cycle test I  
2 told you about, and we picked a fish which grows to  
3 maturity in about ten weeks, which is <sup>a</sup>tropical fish,  
4 and we simply had a row of aquaria here, again with  
5 a different concentration in each, and replica tests,  
6 or duplicate tests.

7 We started with fish fry about  
8 seven days out of the egg, very very tiny. Grew them  
9 in constant concentrations through their whole life  
10 cycle until they matured and reproduced, and then we  
11 kept the eggs down below here, and the same concentrations  
12 studied the hatching, studied the survival of young,  
13 any deformities of young; altogether there are about  
14 twelve different things we observed in this experiment.  
15 Next.

16 Well, I don't think that's  
17 particularly relevant. The only thing here is more  
18 sealing wax and string. You make this yourself and  
19 each set of chambers down here provides a constant  
20 flow of refinery waste at a given concentration. This  
21 goes on night and day, so the tanks are continually  
22 replenished with new waste. And sure enough the fish  
23 grew up, and there is a male flag fish, which is the  
24 one we used, guarding something which you can't see  
25 here. It's a spawning pad down here. He guards the  
26 pad, and when the time comes, the female approaches  
27 in a certain way and he knows it's time, and they go  
28 about their spawning, which I think is shown in the  
29 next page -- or the next slide. No it's not, I'm sorry.  
30 Did you skip one? Well, we won't worry about that.





J.B. Sprague  
In Chief

1 Suffice it to say -- yes, there's flag fish going about  
2 their spawning in oil refinery waste. It's quite an  
3 aggresssive procedure. The reason this is interesting  
4 is that we got the same result with this tropical  
5 fish as we did with trout, that concentration "X" was  
6 the same one as we found for trout, and this had no  
7 ill effects on reproduction, so we had now two  
8 experiments showing the same thing, and then we went  
9 on and did another key experiment.

10 We'd done reproduction which  
11 is a key experiment, we next wanted to look at a very  
12 sensitive invertebrate animal, and we chose water fleas,  
13 called daphnia, d-a-p-h-n-i-a, and since they're very  
14 small you put each of them in these small containers  
15 here, same principle again, different concentrations  
16 of oil refinery wastes going in here. Next.

17 And since they're so small you  
18 have to observe them through a microscope. We did  
19 a reproductive test on daphnia also, complete life cycle,  
20 which only takes two weeks, and the long and the short  
21 of it is that even this sensitive invertebrate was  
22 not harmed by much lower concentrations. It was about  
23 one half of "X", if I can use the same number, so once  
24 again we've confirmed that we're in the right ball  
25 park, for dangerous levels of this waste.



J. B. Sprague  
In Chief

1                                Finally, one other key  
2       experiment. It often happens that some sort of  
3       pollutant may not be harmful to fish, but they don't  
4       like the smell or taste of it so they'll show avoidance  
5       reactions. So, our final experiment was on avoidance  
6       reactions.

7                                The water flows this way. You  
8       put -- to boil it down simply, you put refinery in one  
9       side or the other of this chamber. It flows out through  
10      here in a laminar flow and the fish who's sitting in  
11      here, he's been accustomed to this chamber overnight  
12      so he has a choice of going one side or the other with  
13      effluent or without.

14                              You try, again, various  
15      concentrations and you replicate this many times  
16      and you do this, which is shown on the next slide.

17                              Well, that's just the  
18      apparatus which you saw the diagram of. We can have  
19      the next one.

20                              Yes, you do this. You simply  
21      watch the fish for about two hours a day. We were  
22      going to put this onto a computer which you could put  
23      the fish's movements directly into the computer, but  
24      if you've worked with computers, you know that by the  
25      time you got it set up, you could have done the  
26      experiment.

27                              (LAUGHTER)

28                              We did it the hard way by  
29      sitting there watching in a cold room, observing the  
30      fish and recording his activity and <sup>it</sup> turned out, in this





J. B. Sprague  
in Chief

Cross-Exam by Marshall

1 case that fish did not avoid this effluent. That the  
2 safe levels for reproduction and so on, were not  
3 avoided by fish so it was a pretty happy result all  
4 around.

5 Next. Yes, finally we're  
6 looking for a short-cut lethal test. Nobody wants to  
7 do a one month or a three month test on every refinery  
8 across Canada. We were looking for a short-cut and  
9 the final step was to see if the respiration rates  
10 and the coughing rates -- yes, fish do cough -- were  
11 related to the safe concentration and this is simply a  
12 set of chambers where we put fish overnight in again,  
13 different concentrations and we measured their respira-  
14 tion rate as shown in the next slides.

15 Well, that's the chamber. It's  
16 not a very happy chamber for a small trout, but it  
17 does the job. The electrodes at either end record  
18 the fish's respiration and coughing.

19 Next. You record -- you  
20 probably can't see this, but there's a tracing of his  
21 respiration rate here. You simply measure this and  
22 it looks like the results that we have so far will  
23 be able to establish a rapid short-cut sublethal test  
24 which is related to meaningful sublethal tests and this  
25 will complete our project on oil refinery wastes.

26 That's it.

27 CROSS-EXAMINATION BY MR. MARSHALL:

28 Q Dr. Sprague, I guess I  
29 lead off with questioning. I was interested in the  
30 slides that you just showed. I gather this is an



J. B. Sprague  
Cross-Exam by Marshall

1 experiment that is just in the process of being  
2 completed, is it?

3 A Yes.

4 Q It's being done under  
5 your direction?

6 A Yes.

7 Q If I understand correctly,  
8 you were studying the effects of effluent from a  
9 refinery both on fish and on invertebrates?

10 A Yes.

11 Q In this case, it was  
12 water fleas?

13 A Yes.

14 Q You were dealing with  
15 the direct impact on those, both fish and the inverte-  
16 brates and also whether or not the fish would try to  
17 avoid the effluent?

18 A Yes.

19 Q You seem to be somewhat  
20 surprised at the results that you obtained from the  
21 study.

22 A It wasn't nearly as  
23 nasty as I thought it was going to be -- the waste.

24 Q I take it you're not  
25 in a position to talk to us about the concentration  
26 levels that were encountered?

27 A No, this was a contract,  
28 and the people that provided the money own the results.

29 Q I see. I believe you  
30 mentioned in your evidence that fish are fish. That is,



J. B. Sprague  
Cross-Exam by Marshall

1 that if you test one fish, you can probably extrapolate  
2 fairly safely to other varieties and types of fish.  
3 I think the question's bringing down the house.

4 A I hope I said that fish  
5 tend to be fish, that --

6 Q Yes. No, I don't mean  
7 that they're all the same in all respects, but you  
8 can extrapolate from the results you obtained with  
9 one species of fish to another, much more readily than  
10 one could say between different types of mammals and  
11 so forth?

12 A Yes, it's rather surprising.  
13 But it's nevertheless true. I've just had a student  
14 finishing a project on this, comparing trout with  
15 tropical fish.

16 Q Yes.

17 A The differences are  
18 surprisingly small and there's other evidence on this.

19 Q I suppose if you went  
20 from trout to char, you'd really find no difference  
21 at all in the effects.

22 A The only experiments  
23 I'd done, there was no difference whatsoever between  
24 char -- brook char let's say and trout.

25 Q Sir, would it violate  
26 your contractual arrangements if you were to tell us  
27 if the waste products that you were studying would  
28 be anything like the final products from a refinery  
29 such as -- would they be like fuel oil or lubricants;  
30 gasoline?





J. B. Sprague  
Cross-Exam by Marshall

1 A No, this was the  
2 liquid stream which they discharge from the refinery.  
3 Mostly water, a little bit of oil is in it and not by  
4 intent, but a little bit of phenol, a little bit of  
5 ammonia, a little bit of cyanide, sulfides, a few  
6 things like this.

7 Q You wouldn't want to --

8 A It's waste products.

9 Q You wouldn't want to  
10 drink it.

11 A No.

12 Q You mentioned in your  
13 evidence the example of the crossing of a stream in  
14 the Guelph area by a highway and you mentioned that  
15 the suspended solids reduce the fish populations by  
16 a half. I was wondering, Dr. Sprague if you knew whether  
17 that was due to mortality or to avoidance by the fish?

18 A We don't really know but  
19 we think it's simply avoidance; that they simply moved  
20 downstream.

21 Q On the basis of work that  
22 you've done sir, have you found that fish do have  
23 that ability to avoid something unpleasant in their  
24 environment?

25

26

27

28

29

30



J.B. Sprague  
Cross-Exam by Marshall

1 A Yes, very definitely.

2 Q Have you played --

3 A Not always, I'm sorry.

4 Sometimes they do, sometimes they don't.

5 Q I suppose sometimes they're  
6 not able to.

7 A Sometimes they don't seem  
8 to detect a dangerous pollutant. I have done one  
9 with chlorine, for example, sometimes they're attracted  
10 to levels which will kill them.

11 Q What about suspended  
12 solids, sir?

13 A I'm never worked on  
14 avoidance of those.

15 Q Isn't that what you were  
16 dealing with in this example that you were citing of  
17 the crossing in Guelph?

18 A Yes. I've never done any  
19 laboratory experiments. I think it's fair to say that  
20 fish will avoid very high concentrations of suspended  
21 matter.

22 Q This is something that  
23 you haven't studied but that would be your opinion.

24 A Yes, from reading of  
25 work in other places.

26 Q I wonder, sir, if you  
27 know what sort of levels of concentrations of suspended  
28 solids fish would avoid?

29 A I think we're talking  
about levels in the thousands of parts per million,





J.B. Sprague  
Cross-Exam by Marshall

1 which are very high.

2  
3 Q Well, sir, just before  
4 we leave this example of the crossing of the trout  
5 stream at Guelph, you made a point of explaining that  
6 a very detailed assessment had been done, and I think  
7 you said several inches of study.

8 A Yes.

9 Q Would it be fair to say  
10 that this was a case in which, while there had been  
11 baseline study, there had -- and specifications had  
12 been developed, that there was a failure on enforcement.

13 A Yes, it went back a little  
14 further than that. Recommendations were developed and  
15 most of these were designed in, the constructing  
16 people agreed to these. There was no real -- there were  
17 no real environmental stipulations, there was no permit  
18 incorporating environmental things and there was no  
19 inspection system.

20 Q You and a student made  
21 observations as to what was taking place, I gather  
22 from what you said in your evidence. Had you had  
23 some authority to issue a stop order, I take it you  
24 could have stopped the problem. You could have told  
25 the cat skinner to stop and that would have been the  
26 end of it.

27 A Yes.

28 Q The point is, I suppose,  
29 that in addition to having a study of the area and  
30 knowing what the problems might be, you've got to have  
31 some authority to stop incorrect or improper construction



J.B. Sprague  
Cross-Exam by Marshall

1 practices.

2 A Yes, there was no  
3 mechanism for that.

4 Q I see. Sir, you made  
5 reference to the water quality criteria, 1972, the  
6 Blue Book that was filed as an exhibit. In the  
7 general introduction on the fourth page, the comment  
8 is made, and I'll quote it to you, sir:

9 "The committee wishes to emphasize the caveat  
10 so clearly stated in the introduction to the  
11 Green Book,"

12 which I take it was a predecessor book.

13 A Yes.

14 Q Carrying on with the quote:

15 "The committee does not want to be dogmatic  
16 in making its recommendations. They are meant  
17 as guidelines only to be used in conjunction  
18 with a thorough knowledge of local conditions."

19 I take it you agree with that proposition.

20 A Yes, completely.

21 Q In other words, the  
22 criteria or specifications that would be set out, for  
23 example, in the Blue Book, you would regard as guide-  
24 lines and they have to be interpreted having regard  
25 to the local conditions, and by someone who is  
26 knowledgeable about the local situation, an informed  
27 biologist.

28 A That's quite correct.

29 Q I think essentially the  
30 point Dr. McCart was making -- and I'll just ask you



J. H. Sprague  
Cross-Exam by Marshall

1 if you could care to comment on this and indicate  
2 whether you agree, is that he feels that taking  
3 readings and having some predetermined standard of  
4 general application may be interesting and may be  
5 valuable, particularly in monitoring, but that when  
6 it comes to protection of aquatic resources, the most  
7 important thing is to have a competent aquatic biologist  
8 who is knowledgeable about the local conditions there  
9 to make sure that the appropriate protection measures  
10 are being implemented. I was wondering whether you  
11 agree with that approach?

12 A I think you need both  
13 things. I wouldn't say one is more important than the  
14 other. I think you need the firm numbers to aim at.

15 Q You make mention in your  
16 evidence, sir, about joint industry-government task  
17 force, if I understood you correctly --

18 A M-hm.

19 Q -- to develop specifica-  
20 tions.

21 A Yes.

22 Q I wonder if you might  
23 just expand on that, sir? Do you have a concrete example  
24 from your experience that you found to be effective?

25 A Yes, I'll go back to the  
26 oil refinery regulations again. A Government-Industry  
27 Committee sat and met together every couple of months  
28 and hammered out some regulations which they thought  
29 were scientifically sensible, and also could be attain-  
30 ed without unreasonable expense. These were put into





J.B. Sprague  
Cross-Exam by Marshall

1 regulatory form by the government and have been very  
2 successful. New oil refineries are consistently  
3 meeting these regulations that I spoke about, and for  
4 example, this oil refinery we tested, every -- twice  
5 a week when we got in a new batch of effluent we'd run  
6 this simple fish test for lethal action, and over 3½  
7 months we never found a batch of effluent which was  
8 lethal to fish. I would say this was a long step  
9 forward from where we used to be.

10 Q And I take it it's your  
11 recommendation with respect to the pipeline project  
12 the same approach would be followed, that you have  
13 both government regulatory people and representatives  
14 of industry who are knowledgeable about pipelining  
15 and their advisors work on a task force to develop  
16 appropriate regulations.

17 A Yes.

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J.B. Sprague  
Cross-Exam by Marshall

1 I think that's the way  
2 the progress is made the fastest, and I don't think the  
3 scientific or technical aspect of that need take very  
4 long. I don't think it needs to take two years like  
5 the oil refinery regulations took.

6 Q Well particularly perhaps  
7 in a case such as this where there has -- I think you'll  
8 agree with me, <sup>been</sup> quite extensive environmental assessment  
9 done, respecting aquatic resources that might be affected.

10 A Yes.

11 Q I believe you mentioned  
12 that it's your opinion that the responsibility of  
13 the government for the establishment of standards and  
14 regulations is the government's, in order that they  
15 may be the most appropriate and effective, that they  
16 ought to be developed in co-operation with the industry  
17 to be regulated.

18 A Yes. I think the more  
19 people you have in on this, the more likely you are  
20 to achieve something sensible.

21 Q Sir, had you been aware  
22 of the work that was being done by the Department of  
23 the Environment and industry, on environmental  
24 guidelines?

25 A For what?

26 Q Pipelines.

27 A Yes, I've read some of  
28 these.

29 Q Have you been involved  
30 at all in that, yourself?





J.D. Sprague  
Cross Exam by Marshall

1 A No.

2 Q With respect to inspection,  
3 Dr. Sprague, it just wasn't quite clear to me from  
4 your evidence exactly what you had in mind, and do I  
5 understand correctly that you were suggesting that there  
6 be three environmental inspectors, particularly with  
7 respect to aquatic matters. One, a representative  
8 of the company, one a representative of government,  
9 and one an inspector for an independent group or  
10 agency?

11 A Yes.

12 Q You related that in some  
13 way to the EPB suggestion, and it may perhaps have been  
14 a misunderstanding on my part, but I had understood  
15 Mr. Templeton's and Dr. Wilimovsky's approach to be that  
16 they were interested in an independent audit group,  
17 not necessarily a field inspection team on the site  
18 at any given time, but a group -- independent group  
19 that would perform an auditing function with a  
20 relatively small staff, visiting various locations  
21 to check to see if the environmental inspectors of  
22 government and the industry were doing their jobs.  
23 Is there a difference in opinion between you and my  
24 understanding of the EPB's recommendation?

25 A There may not be that  
26 much difference. Perhaps, if I were setting it up  
27 I'd have a few more -- probably biologists, in the field  
28 as inspectors, than they had in mind.

29 Q Well the problem that I  
30 foresee sir, and I wondered if you might comment on



1 this, is that of conflict between three different  
2 environmental inspectors all trying to do the same  
3 job. There'd be perhaps an environmental inspector  
4 from the company building the pipeline, and undoubtedly  
5 the regulatory agency established by government would  
6 have an environmental inspector. One can presume safely  
7 I think that the regulatory agency would have authority  
8 to issue a stop order. And then on top of that you  
9 see an additional independent environmental inspector  
10 there as well?

11 A Yes, I think they'd  
12 have to have their own resources to make their own  
13 checks. I really don't think they'd be in conflict  
14 very much, I would imagine that they'd be in general  
15 agreement most of the time.

16 Q I suppose that may well  
17 be. Sir, with respect to the matter of siltation,  
18 you mentioned that you had a minor criticism I think  
19 you put it with the way it was dealt with in the  
20 application materials and that the lethal effects were  
21 dealt with first, and the sublethal effects were not  
22 dealt with until later, in Section 7.7.

23 A Well, I thought the  
24 initial stress on how much silt it took to kill fish  
25 was not too relevant, really. Quite a bit of emphasis  
26 was laid on this at the first, and I think I simply  
27 said that this wasn't the key issue here.

28 Q The question of sublethal  
29 effects was dealt with.

30 A Oh yes.



J.B. Sprague  
Cross-Exam by Marshall

1 Q Are you familiar with  
2 volume 15 of the Biological Report Series, where the  
3 the papers by McCart and McGrath, and Craig and McCart,  
4 this question was dealt with?

5 A Yes, I've read those,  
6 I've read that one.

7 Q So it would be fair to  
8 say that there has been a detailed consideration given  
9 to this matter of siltation in aquatic environments  
10 work?

11 A Yes.

12 Q On page 10 of your prepared  
13 evidence that was circulated sir, you talk about the  
14 biological standard, and you say quote, you say it  
15 should be something such as quote,

16 "The diversity index of benthic macro-organisms  
17 should not be changed more than 25%, at a distance  
18 of ¼ mile downstream of operations."

19 It's perhaps a quibble sir, but when you say, "not  
20 be changed more than 25%", are you worried about up  
21 or down, or just down?

22 A I'm worried about up or  
23 down, yes.

24 Q It's clear to others, but  
25 it isn't clear to me. Why would it be a concern if  
26 it was changed more than 25% up?

27 A In general, it's usually  
28 thought that increased diversity is a quote, "good thing",  
29 unquote. This isn't necessarily always so, that you  
30 can have a clean water assemblage with relatively few





1 species and low diversity, and you can sometimes have  
2 an affected or polluted water assemblage, which actually  
3 has more kinds of organisms, and more diversity.  
4 Usually this doesn't happen, but it can happen.

5 Q Sir, on page 11 of the  
6 prepared evidence, you're talking about petroleum,  
7 and you say the accepted and reasonable criterion to  
8 guard against this is quote, "no visible sheen of oil  
9 on the surface of the water", unquote. I'm told that  
10 in some areas, such a sheen naturally occurs, particularly  
11 if they are areas with high organic content, such as  
12 is often found in deltas.

13 A M-hm.

14 Q Is that so, in your  
15 experience?

16 A Yes, I think you're likely  
17 to find this, and I think in this case you've always  
18 got to relate conditions downstream to natural  
19 conditions. You've always got to do that.

20 Q Sir on page 14 of your  
21 evidence, you dealt with the matter of methanol  
22 disposal, and it seemed to me that what you were talking  
23 about was pretty close to what Dr. McCart had in mind,  
24 and I just wanted to run through that with you. My  
25 understanding of his evidence was that with respect  
26 to distilled methanol that was being disposed of into  
27 a water course, that in order to ensure that the  
28 concentrations were below the appropriate level, and  
29 you have suggested certain levels here, that there  
30 ought perhaps be a metering out of it, to ensure that



J.B. Sprague  
Cross-Exam by Marshall

1 when the methanol effluent enters the water course, the  
2 distillation -- the flow in the water course is  
3 sufficient to ensure disillation below the levels that  
4 would be deemed necessary for protection of aquatic  
5 resources. Is that essentially what you had in mind?

6 A Yes, to ensure dilution?

7 Q Yes.

8 A Yes. I don't think there's  
9 any basic disagreement here at all.

10 Q Sir, Mr. Scott when he  
11 was qualifying you, did mention that you had some  
12 experience in the north, but he didn't go into any  
13 detail on that at all, and I wondered if you just might  
14 outline a little detail than was gone into, some of  
15 the work that you have done in the north, particularly  
16 any that might relate to the Mackenzie, or the rivers  
17 on the North Slope?

18 A Well, it's not very much.  
19 Most of my work has been in the south. I think I  
20 mentioned one summer in Churchill when I was working  
21 out on aquatic systems of biting flies, of course,  
22 this was partly aquatic. I've worked on mining waste  
23 in Labrador , which is perhaps almost subArctic at times.

24 Q Well, to Mr. Scott those  
25 are all north.

26 A All right. I had a contract  
27 with the Fisheries Service, to study the toxicity of  
28 mine waste from the Northwest Territories, and the  
29 toxicity of drilling fluids from the Northwest Territories.

30 Q Was that in this region,





J.B. Sprague  
Cross Exam by Marshall

1 Yellowknife?

2 A Yes. We sampled five  
3 mines, and sent samples of effluent to us, and we  
4 tested three drilling fluids from the delta, and we  
5 simulated drilling fluid in our lab, and this checked  
6 out pretty well against the actual drilling fluid,  
7 and then we did -- there was about a two year project  
8 on toxicity of drilling fluids, where we found that  
9 a few of the components were quite toxic, and mostly  
10 these were detergents and rig-washes, and many of the  
11 other things were not particularly toxic.

12 I think partly as a result  
13 of that work, that the most toxic compounds have been  
14 substituted by other materials, since then. That was  
15 starting in 1972 we did that.

16 Q I note Mr. Fraser's keen  
17 interest when I mentioned mines in Yellowknife area,  
18 and my apologies to you in advance sir, if I've set  
19 you up for a CBC interview.

20 A I'd say we did this in  
21 1972, and it's been a long time, I'm not sure if I  
22 can remember details.

23 Q I was wondering sir whether  
24 in any of your past work you had had any experience  
25 with pipelining?

26 A No.

27 Q Dr. McCart has advised  
28 me that in his opinion, benthic invertebrates have  
29 a remarkable capacity to recover from sedimentation,  
30 provided that it is short-term. I was wondering



J.B. Sprague  
Cross-Exam by Marshall

1 whether or not you share that opinion?  
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J.D. Sprague  
Cross-Exam by Marshall

1 A I completely agree with  
2 that.

3 Q And he indicated as well  
4 that if sedimentation is short-term that normal hydro-  
5 logical events within water courses can be expected  
6 to restore the stream bed. Would you agree with that?

7 A Yes, that's true. However,  
8 if the problem that was causing sedimentation continued,  
9 of course then it's prolonged.

10 Q Right. So the concern  
11 must be then to ensure that sedimentation is minimized  
12 and that long-term erosion is stopped.

13 A Yes, that's really the  
14 important point. The short-term effects of one crossing  
15 may not be serious, but the long-term effects of erosion  
16 can be very serious.

17 Q Now, sir, with pipeline  
18 construction going on mostly in the wintertime, there  
19 will be of course some of the major crossings that  
20 are done in the summer. The spring freshet of the  
21 following year could be expected to remove a good  
22 deal of any sedimentation that might have taken place  
23 due to that construction, provided, of course, that  
24 there is not an ongoing erosion problem.

25 A Yes, I'd agree with that.

26 Q Now, sir, perhaps I  
27 ought to have asked you this question a bit earlier.  
28 On page 10 again dealing with the biological standard  
29 that you suggested, perhaps I should just read the  
30 paragraph:





J.B. Sprague  
Cross-Exam by Marshall  
Cross-Exam by Hollingworth

1 "The biological standard might be, for example,  
2 something such as, 'the diversity index of  
3 benthic macro-organisms should not be changed  
4 more than 25% at a distance of one-quarter  
5 mile downstream of operations."

6 I was wondering, sir, if you had considered how this  
7 standard might work as a practical surveillance measure  
8 in winter, when most of the streams are frozen to the  
9 bottom, when water that is available is covered by  
10 several feet of ice?

11 A Yes, I don't think it  
12 would work in winter here, although my students are  
13 able to do sampling in January in Southern Ontario, I  
14 don't think that's very practical here.

15 Q Yes. So that with res-  
16 spect to the construction period, it might not be too  
17 helpful at that time, but it might be very useful as  
18 a monitoring device.

19 A It could be, well it  
20 could be useful for summer operations but winter sampling  
21 of benthos, I think, is rather difficult.

22 MR. MARSHALL: I think those  
23 are all my questions. Thank you, Dr. Sprague.

24  
25 CROSS-EXAMINATION BY MR. HOLLINGWORTH:

26 Q Dr. Sprague, I was looking  
27 at page 2 of your evidence, and your concern expressed  
28 in the second paragraph, that

29 "People on a construction project usually have  
30 their hands full dealing with the everyday



J.B. Sprague  
Cross-Exam by Hollingworth

1 problems and crises of getting their jobs  
2 seldom have the  
3 done, and they/leisure for day to day con-  
4 sideration of environmental side effects."

5 But you are, of course, aware that with this project  
6 it is contemplated that there would be people whose  
7 only involvement with the project and reason for being  
8 there would be to monitor and be concerned with the  
9 environmental matters.

10 A I'm aware that that's  
11 the plan, yes.

12 Q And so that removes a  
13 good deal of the concern surely you've expressed in that  
14 paragraph, does it not?

15 A Well, it depends how it's  
16 worked and how many people are concerned with environ-  
17 mental problems in relation to how many people are  
18 doing the construction.

19 Q Well yes, but your  
20 concern is that there are not people there whose  
21 concern is environmental matters.

22 A Yes.

23 Q And that concern is  
24 going to be removed by having people on-site who are  
25 concerned with them.

26 A I hope so, if it's set  
27 up properly.

28 Q And on page 8, sir,  
29 at the end of the third paragraph, you state that you're  
30 pessimistic about the likelihood of success of suggested  
31 revegetation procedures, but judging from your comment





J.B. Sprague  
Cross-Exam by Hollingworth

1 on the first page of your evidence, this would apply  
2 only to the proposed Arctic Gas revegetation procedures.

3 A That was in my written  
4 preliminary decision. I did not say that in the  
5 testimony yesterday for the reason that although I'm a  
6 biologist, this is really outside my special field of  
7 knowledge and perhaps the written comment --

8 Q You don't feel qualified  
9 to make it?

10 A -- I don't think I should  
11 feel qualified.

12 Q All right. If I can go  
13 back to page 10 which Mr. Marshall discussed with you,  
14 the creation of a biological standard. I was just  
15 wondering when that standard would be applied in your  
16 thinking?

17 A Well, as I said I think  
18 it would be most useful in summer operations. For  
19 winter operations I think it's impossible to do  
20 sampling in the winter.

21 Q Well, what I'm really  
22 driving at, is if you have a pipeline that goes across  
23 a creek and then presumably moves on, how long after  
24 that operation do you contemplate this check being  
25 made to see whether the change in benthic macro-organ-  
26 isms has been more than 25% either up or down?

27 A Well, I think the chief  
28 thing that this would guard against is any continuing  
29 effect, so therefore after you've made a crossing  
30 you could use this in the summertime to check for a



J.B. Sprague  
Cross-Exam by Hollingworth

1 continuing effect from such things as slumping or  
2 erosion.

3 Q So it's more or less  
4 siltation -- it's more to check siltation that might  
5 have arisen from eroding banks where the pipeline  
6 crosses --

7 A Yes, we just said that  
8 a once through operation would probably be cured by  
9 the spring freshet.

10 Q -- so given your  
11 answer now and the fact that you've agreed it would  
12 be difficult to do this in winter with streams frozen  
13 to the bottom, this is really a part of the O. & M.,  
14 operations and maintenance phase rather than construc-  
15 tion itself, is it?

16 A Yes, I think you could  
17 use it in the summer following construction to check  
18 against a continuing effect even then.

19 Q Would there be any way  
20 you know of to check it at the time of construction  
21 in the winter?

22 A With this biological  
23 standard?

24 Q Yes.

25 A No.

26 Q There isn't, eh?

27 A No, I've never worked in  
28 winter in the Arctic, the subArctic.

29 Q Well, a concern of my  
30 client, sir, is to get a technique that's operational



J.B. Sprague  
Cross-Exam by Hollingworth

1 in the field, and operational at the time of construction.  
2 I just wondered if you could help us out.

3 A I don't think this  
4 one will work in winter.

5 Q At page 12 of your  
6 evidence, sir, you're discussing sewage and I just  
7 wondered if you felt that lagoons were feasible in  
8 this area in view of the small amount of sun and light  
9 that occurs in the winter period?

10 A Oh, I think during the  
11 winter you're simply storing, you're not hoping for  
12 much biological treatment during wintertime, you're  
13 simply storing.

14 Q And that's why you're  
15 suggesting lagooning for a year, is it?

16 A No, I think that's the  
17 Arctic Gas' suggestion, isn't it?

18 Q Well, yes it is, sir, but  
19 I was just wondering what your feeling is that it should  
20 be lagooned for a year for that reason?

21 A Yes, you depend on biolo-  
22 gical activity in the summertime.

23 Q All right. Now your second  
24 regulation says that the sewage should be disposed of  
25 on land in most cases. Would you regard a bog as being  
26 acceptable?

27 A I guess it depends on the  
28 kind of bog. I mean are you speaking of very shallow  
29 water and <sup>perhaps</sup> no fish, this type of thing?

30 Q Oh yes, no fish.





A I suppose it could be acceptable. I don't see any reason why it couldn't just go onto land, dry land. There's not that much dry land around in places, but --

A Oh yes, into a bog?

10 A No, I wasn't.

12 A However, I would say that  
13 many present facilities are not suitable and that  
14 doesn't necessarily mean that that's suitable. Many  
15 government facilities are present are not really  
16 satisfactory.

19 A Yes, I think this is an  
20 ecologically sound method, actually.

24 | A Well, again I think it  
25 | would depend on the importance of that slough.

23 A Biological importance,  
fisheries, birds, this type of thing.

Q Well, assume there were  
no fish in it.



J.B. Sprague  
Cross-Exam by Hollingworth

1                   A     Well, you're going to  
2     get enrichment and strange growths of organisms and  
3     reduced oxygen. My basic problem here is I don't  
4     really see why you'd have to put this stuff into  
5     water, because most of the nutrients originally came  
6     from the land and really if you're going to be ecologically  
7     sound you should return them to the land.

8                   Q     That's the natural place  
9     to deposit them, as far as you're concerned.

10                  A     Yes. One definition of  
11     pollution is an element out of place, and the proper  
12     ecosystem for all these land-based nutrients is back  
13     on the land. I know it's not the same land, but -- so  
14     I find it hard to understand this almost obsession  
15     that people have had for a hundred or 200 years of  
16     putting their sewage into water. It really doesn't  
17     make much sense to me.

18                  MR. HOLLINGWORTH: O.K., thank  
19     you, sir. Those are my questions.

20                  THE COMMISSIONER: Wasn't that  
21     something that only came about with the development of  
22     pipes for sewage systems? Really, public health, so  
23     to speak, was responsible for that.

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J. B. Sprague  
Cross-Exam by Bayly

1 A  
For many years, it was forbidden

2 to put sanitary waste into the sewage system and then  
3 it suddenly switched for health reasons and we've been  
4 stuck with that ever since.

5 CROSS-EXAMINATION BY MR. BAYLY:

6 Q Dr. Sprague, on page  
7 four of your evidence, you suggest that the north might  
8 be more vulnerable to short-term disruptions and it  
9 may be more important to adhere strictly to criteria  
10 and I presume you're referring there to the criteria  
11 set out in the blue book that you've referred to in  
12 your evidence?

13 A Yes.

14 Q Would you feel that it  
15 might also be important to develop more stringent criteria?

16 A Not really.

17 Q You feel that those that  
18 are set out in this blue book are sufficient to cover  
19 the kinds of waters and living things in them that  
20 occur in the north?

21 A Well, perhaps you could  
22 find exceptions, but I think they'd be very few.

23 Q Now, you've referred us  
24 to your experience with the stream close to Guelph and  
25 you've answered some questions of Mr. Marshall's. Do  
26 you know from your observations what field instructions  
27 were given to the people actually carrying out the project  
28 and to what level of personnel these were given?

29 A No, I really don't know  
30 much about that. I'm sorry.



J. B. Sprague  
Cross-Exam by Bayly

1                   Q     You've referred to the  
2 caterpillar operator going across the stream and I  
3 gather then you don't know whether he was given the  
4 instructions not to, or whether these were just  
5 recommendations?

6                   A     No, I really don't know  
7 that. It was very difficult to find out what was  
8 going on. We were simply an advisory team who would  
9 meet with the city and the Provincial Government from  
10 time to time, and it was very difficult to find out  
11 just what was going on between the people who let the  
12 contract and the people doing the job.

13                  Q     I take it from your  
14 experience, you would recommend that whatever instruc-  
15 tions were, were given at the higher level should be  
16 transmitted to those people who actually had to do  
17 the physical work?

18                  A     Oh, yes, something like  
19 this has been laid out here with regulations and  
20 training programs and inspectors.

21                  Q     Would you feel that if  
22 there were a -- that the inspectors or they key to it?

23                  A     Well, I think you can't  
24 divorce one part from the other. I think all of the  
25 things are needed; the regulations and the training  
26 program and the inspection, human nature being what it is.

27                  Q     Yes. On page four again,  
28 you use as an example a federal regulations in which  
29 the requirement is that the undiluted effluent dis-  
30 charged into water courses should not kill rainbow trout.



J. B. Sprague  
Cross-Exam by Bayly

1 In your opinion, is the location of the discharge of  
2 effluents also a matter that should be regulated in  
3 projects like this, whether it be sewage or industrial  
4 products related to either the pipeline itself or to  
5 processing facilities?

6 A Yes. I think I've given  
7 a couple of situations in here where the suggestion  
8 was made not to discharge into small water courses.

9 Q You gave an example,  
10 I believe, as well of an engineering masterpiece of a  
11 sewage line which was an ecological disaster in your  
12 own home area.

13 A I don't think we're going  
14 to see that here, I hope.

15 Q All right. Are these  
16 kinds of things, things we could look for in the blue  
17 book, or would we have to go somewhere else to find  
18 the kind of recommendations that should be carried into  
19 effect.

20 A They're not in the blue  
21 book. There's a little bit about dilution and mixing  
22 zones, but very little.

23 Q Where would this be found,  
24 presuming that this work has not been done already  
25 either by either of the companies that are involved  
26 in this proposal?

27 A You're speaking about  
28 size of water body, for example?

29 Q I'm speaking really of  
30 the problem of where you discharge things that may be





J. B. Sprague  
Cross-Exam by Bayly

1 saved to discharge under some circumstances but not  
2 in others. The size of water body may be one, I  
3 suppose. Another may be kind of water body. It may  
4 be safe, for example, taking the situation presented  
5 to you by Mr. Hollingworth to discharge some things  
6 into water bodies in which there are no fish, but not  
7 safe into water bodies in which there fish.

8 A I think this is where  
9 this group of people with a local knowledge comes in.  
10 That if you get such a group together, they can make  
11 sensible decisions on this.

12 Q Do you feel they  
13 should be an on-the-spot type of thing, or something  
14 by which standards are set in advance?

15 A I think you do this in  
16 advance. It's very troublesome to try and make these  
17 decisions when the bulldozers are bearing down on you.

18 Q Do you feel that this  
19 is this joint responsibility of industry and government  
20 that you've referred to in other parts of your evidence?

21 A I think it's the  
22 responsibility of government, but I think it works  
23 best with both people involved.

24 Q Now, we've been told  
25 by other witnesses that it may be that we have  
26 enough regulations and laws at present, if they were  
27 enforced properly, to regulate the kinds of things  
28 that you're concerned with. I understand you're  
29 familiar with both the fisheries and the Northern  
30 Inland Waters Act and I wonder if you feel that they



J. B. Sprague  
Cross-Exam by Bayly

1 have a contribution to make or whether there should be  
2 additions to them to help enforce regulations that you  
3 see as important.

4 A No, I really think you  
5 need a special code of regulations for this project.  
6 It's a big project with special problems and it's very  
7 confusing going from one government agency to another  
8 and one set of regulations to another. I think really,  
9 you need one code here for the project and it might  
10 invoke parts of other government regulations but I  
11 think it should be all in one place.

12 Q On page six of your  
13 evidence, you talk about an independent group of  
14 demonstrated capability and integrity, to do the large  
15 task of inspection, monitoring and --

16 A Auditing.

17 Q -- auditing of the  
18 project. Now, did you have a group in mind, or --

19 A I found it very difficult  
20 to think of what groups we had available. You first  
21 might think of perhaps professional societies who  
22 would be completely unbiased, and I can't think of any  
23 environmental society that right at present has the  
24 central office and continuing organization to handle  
25 this; like the Canadian Society of Wildlife and Fisher-  
26 ies Biologists or something like this. I really don't  
27 think <sup>they've</sup> got the centralization to handle this. I  
28 don't know.

29 I think it's important that  
30 this should be some group that has already demonstrated





J. B. Sprague  
Cross-Exam by Bayly

1 that they have capability of continuing to be effective.

2 Q Well, if you can't think  
3 of one, how are they going to be able to demonstrate this  
4 capability before this project begins?

5 A That's a very good  
6 question. Really, the only one that I thought had had  
7 a continuing show of performance over the years was  
8 the Canadian Arctic Resources Committee. It's the  
9 only one that came to mind that has a central office  
10 and has managed to field officers and is relatively  
11 unbiased, although I might get some arguments about  
12 that.

13 MR. SCOTT: Not from CARC

14 MR. BAYLY: So, it may be  
15 that with difficulty of thinking of a single organization,  
16 it might be necessary to form a new one; perhaps  
17 combining personnel from some of the organizations you  
18 think have demonstrated some of the capabilities  
19 that you're looking for?

20 A Perhaps it might be  
21 necessary, yes.

22 Q I gather we can't find  
23 anybody that's demonstrated capability on a project of  
24 this magnitude or nature, we'd have to look to other  
25 examples of their work to --

26 A I can't think of a  
27 Canadian one.

28 Q Can you think of ones  
29 elsewhere in the world?

30 A No, I'm sorry. I don't



J. B. Sprague  
Cross-Exam by Bayly

1 know.

2 Q The reason I asked that  
3 Dr. Sprague, is I think that the / <sup>Inquiry</sup> among other groups  
4 is looking for at least an example that could be  
5 followed to monitor this project and some suggestions  
6 have been made by the Environment Protection Board  
7 but none seem to have given us any idea of what this  
8 organization might look like, from where its personnel  
9 might be drawn.

10 A Well, perhaps I'm at a  
11 loss here too. I --

12 Q You've discussed on  
13 page seven, insecticides and I gather they come in  
14 two broad categories, one being persistent and the  
15 other being nonpersistent. Persistent ones including  
16 things like D.D.T.

17 A That's right.

18 Q I assume that of the  
19 nonpersistent ones, there are some that are more  
20 persistent than others; that last longer before they  
21 dissolve or change into other compounds?  
22  
23  
24  
25  
26  
27  
28  
29  
30



J.B. Sprague  
Cross-Exam by Bayly

1 A Yes, that's right.

2 Q And would it be possible  
3 for either the government or the pipeline companies  
4 or the two in combination to come up with a range of  
5 these that might be appropriate to do the job?

6 A Oh yes, I think there's  
7 a lot of information on that. You could select one.  
8 You're never going to get a perfect one that it's  
9 mosquitoes and nothing else. You just won't get this,  
10 but you can get one that's somewhat selective and  
11 perhaps would be relatively harmless to the rest of  
12 the environment.

13 Q And realizing that most  
14 of the project is to be -- is planned to be constructed  
15 in the winter, I take it your concern with insecticides  
16 for those summer operations like the construction of  
17 water crossings, compressor stations, and the operation  
18 of facilities after construction is completed?

19 A Yes.

20 Q On page 4 you say that,  
21 fish are fish and we've heard evidence that some  
22 fish are more -- some fish species are more resilient  
23 than others. Some react to handling differently from  
24 others and what I'm concerned with is, are there some  
25 fish either in their adult stage or juvenile stage  
26 or even in their egg stage that may be more sensitive  
27 to certain pollutants than others?

28 A Yes, there are some,  
29 and when I was saying that fish tend to be fish, I was  
30 speaking about resistance to pollutants. There are





J.B. Sprague  
Cross-Exam by Bayly

1 some that are more resistant to pollutants, sometimes  
2 surprising ones like bass maybe more resistant to  
3 heavy metals than you'd expect. You might expect them  
4 to be sensitive but they're more resistant than some  
5 mounted fish.

6 In other cases, carp and trout  
7 will give you exactly the same answer on toxicity of  
8 for example ammonia; but there are some species which  
9 are more resistant, and I'm sure there are some  
10 species which are more sensitive. But in general if  
11 you had to predict, you'd predict it for one species  
12 and you could predict it for another.

13 Q All right, but if we  
14 think of -- and maybe this isn't the fair thing to do --  
15 if we think of siltation, for example, as a form of  
16 pollution of aquatic environments, I take it that  
17 fish that normally inhabit turbid waters may be able  
18 to tolerate siltation at least differently from those  
19 that inhabit clear water streams.

20 A I would think that  
21 usually the differences that you might find would be  
22 in the spawning and the eggs.

23 Q Yes.

24 A They wouldn't necessarily  
25 be different, but they would perhaps go some place  
26 else to spawn or something like this.

27 Q So there may be a  
28 difference in the avoidance reaction of the adults.

29 A Oh yes, sure.

30 Q And if this isn't a



J.B. Sprague  
Cross-Exam by Bayly

1 chemical reaction to certain forms of pollution, it's  
2 at least a behavioural one.

3 A It would be, yes.

4 Q Now, on page 6 you talk  
5 about in general terms the sizes, there should be a  
6 minimum size crew that is designated which should be  
7 covered by a certain size of inspection force. Have  
8 you any contribution you can make as to what that  
9 numerical relationship might be?

10 A I'm a little bit off base  
11 here because I've read the Biological Reports and  
12 environmental reports. I really haven't read much  
13 about construction procedures, so I'm a little bit  
14 vague on what the spread is and how big it is and how  
15 many people.

16 Q Well, we've been told  
17 that spreads may be -- and perhaps Mr. Marshall can  
18 correct me if I've got my figures wrong  
19 off the top of my head -- may include seven to 800  
20 men, and may be as much as 40 or 50 miles long. Would  
21 that be a fair statement, Mr. Marshall?

22 MR. HOLLINGWORTH: Are you  
23 only speaking about Arctic Gas' spreads?

24 MR. MARSHALL: The spread  
25 section; I guess that's about right.

26 MR. BAYLY: Let's assume  
27 those are figures that are within the range. Can you  
28 offer any suggestions of the size of inspection force  
29 that might be required to cover that area and  
30 that number of operating construction personnel?



J.B. Sprague  
Cross-Exam by Bayly

1 A Oh yes, that seems  
2 fairly handleable. I don't think there should be  
3 a great problem of having one person on a group like  
4 that.

5 Q So a single inspector  
6 for water quality, or a single inspector for water  
7 quality and other things?

8 A I'm not sure of that,  
9 whether he should deal with all aspects of environment  
10 or just some, because he runs into the same old  
11 problem as you run into with all witnesses, that they  
12 have their special field, and a bird man might not  
13 be able to do much for you on fish.

14 Q So we may run into not a  
15 problem of a person not being able to handle that size  
16 an area or work force, but his expertise may not permit  
17 him to be knowledgeable of the kinds of problems that  
18 are arising.

19 A Could be, we'd perhaps  
20 have to have a training program for the inspectors.

21 Q In your example that has  
22 been discussed by both Mr. Marshall and Mr. Hollingworth  
23 your measure of the effect on benthic organisms, of  
24 not more than 25% of the distance of one-quarter mile,  
25 is this an example that you have chosen that relates  
26 to other areas, or is this an example that you would  
27 like us to consider applying for northern streams and  
28 pipeline crossings?

29 A It may be a reasonable  
30 number, although I said all these numbers are put up





J.B. Etienne  
Cross-Exam by Bayly

1 as an illustration because I think this is how things  
2 move faster, if somebody puts something up they get  
3 shot down and perhaps is a faster way of progressing  
4 than suggesting nothing. So all these are illustrations  
5 but that particular one might not be unreasonable. I  
6 think one-quarter mile is fairly lenient and I think  
7 the 25% is fairly reasonable. I know that the risk  
8 index is often quite low in northern areas. But it's  
9 still a fairly reasonable number, I think.

10 Q Now on page 11 you state  
11 that:

12 "Oil should not exceed .05% of the lethal  
13 concentration."

14 I'm wondering if you really mean that these concentrations  
15 should never be exceeded, or whether you mean that these  
16 concentrations can be tolerated over a long-term.

17 A I think the usual way you  
18 take these criteria is this is the maximum amount.  
19 Sometimes they say, "No greater than such-and-such at  
20 any time or place, and the average shall not be  
21 greater than some other number during 24 hours, or  
22 during the week." But these particular numbers are  
23 supposed to be maximum.

24 Q Would this apply to a  
25 planned discharge of petroleum products? I'm assuming  
26 this doesn't apply to an accidental spill because you  
27 can't ask a person not to accidentally spill more than  
28 a certain concentration.

29 A Well, you can ask them.

30 Q You can ask them but



J.B. Sprague  
Cross-Exam by Bayly

1 that's --

2 A This would apply to a  
3 discharge and this factor of one-fifth is fairly  
4 modest but usually it's one-tenth or one-twentieth  
5 of lethal concentration is usually tolerable for a long  
6 period, so one-fifth is playing it pretty close and  
7 that's why this would be a maximum concentration.

8 Q All right. In the  
9 12th page of your evidence you state that you agree with  
10 the E.P.B. recommendation on dissolved oxygen and then  
11 you refer to the high level of protection in the Blue  
12 Book. Now, as you know, in northern waters there is  
13 ice cover for a large part of the year and snow over  
14 that ice, and as I understand it, for oxygenation to  
15 occur you need light penetration, and what I'm wonder-  
16 ing is whether your standards in the Blue Book in  
17 this area might have to be looked at again because  
18 of the sustained ice and snow cover over waters?

19 A No, I don't think so.

20 Q You think they cover that  
21 situation?

22 A Well, most of the aeration  
23 of swift running waters is surface, not from plant  
24 activity and the numbers are based on the reaction of  
25 fish and you can't change that very much. These are  
26 much the same for most North American fish. So I think  
27 these stand, and as I said although they're different  
28 names from the two books, it's the same level they're  
29 speaking of.

30 Q Now, throughout your



J.B. Sprague  
Cross-Exam by Rayly

1 evidence you suggest that someone should provide the  
2 appropriate numbers and so far we don't know who these  
3 people are. You've offered as your main criticism of  
4 both the applicants and the assessors that the numbers  
5 are not provided. What I'm concerned with is, who you  
6 would suggest provide these numbers?





J.B. Sprague  
Cross-Exam by Bayly

1                   A     Well, you need these people  
2 with local knowledge, and the obvious people were sitting  
3 here on the panel. These people are <sup>their</sup> employees. That's  
4 a beginning, the aquatic people, Dr. McCart, the other  
5 side should be government people that are familiar  
6 with this area, and I don't think there's a problem  
7 finding them, and then a third group would probably  
8 have to be familiar with how you use water quality  
9 criteria. I think that a lot of the people who've  
10 been involved in this project have been people who've  
11 been doing surveys, and base line surveys, but might  
12 not be too familiar with the criteria themselves,  
13 or what they're based on, so I think you need a third  
14 group of people, that might not know too much about the  
15 area, but would know about criteria and how you use them.  
16 So I think you get six or eight people with these  
17 skills together, it <sup>wouldn't</sup> take them very long to set  
18 up some sensible numbers.

19                   Q     All right. And these  
20 numbers, you say shouldn't take too long to set up.

21                   A     No.

22                   Q     What would we be looking  
23 at in terms of time? How many seasons would be  
24 required, or how many months or years?

25                   A     Well, in these things  
26 it's usually best if you get the group together and  
27 let them have an initial go at it, and then give them  
28 a little period to cool off or think some more, or  
29 get some more information, perhaps a month, get them  
30 together again, and see if they can reach a decision.



J.B. Sprague  
Cross-Exam by Bayly

1 I would think that a couple of months for the technical  
2 people is plenty, myself. I don't really see it need  
3 take longer than that.

4 That's not the long part. The  
5 long part is getting the government to put them into  
6 a regulatory form.

7 Q Now, Mr. Templeton in his  
8 evidence and appearances before the Inquiry, has  
9 several times exhorted both government and industry  
10 to get on with this kind of thing, and would you  
11 join in that chorus that this is something that should  
12 be looked at as soon as possible?

13 A Yes, I've been trying  
14 to chorus that way for a day or so.

15 Q Now, your last section  
16 deals with general pollutants, and ones that aren't  
17 mentioned that come to mind, include fertilizer run-off,  
18 we've heard that the re-vegetation of the line will  
19 include certain fertilizers, and presumably there may  
20 be a problem to some of them running off the land, and  
21 the other problem that comes to mind is that if there  
22 is some sort of an accident and fertilizer is spilled  
23 into a water course, we may be faced with some problems.

24 A I can't really look on  
25 this as a serious problem in the short term. Only  
26 if it's a long continued fertilizing effect, could  
27 you have problems, especially in lakes, but in the  
28 short term, I think this is adequately dealt with  
29 by the water bodies. Generally, there are sinks,  
30 for these nutrients in the bottom muds of lakes and



1 things like this, and you might have a temporary bloom,  
2 but for one season of fertilizing, or even two seasons,  
3 I really couldn't get very excited about this myself,  
4 except in perhaps very special situations.

5 Q Now, we've heard when  
6 we were in Inuvik, that some fluids, -- that is the,  
7 sorry -- some fluids may contain a number of compounds  
8 that have been used in drilling muds, and apparently  
9 they -- the possibilities anyway number in the hundreds  
10 of compounds. Have you any concern about those  
11 compounds, either in the sumps or in transit to sumps?

12 A I think really the only  
13 concern here is if the end of the sump or lagoon  
14 washes out, and it all exits into a stream. I think  
15 the only concern here is the standard one of sedimentation,  
16 which we've spoken of before. This is the thing that  
17 I'd worry about, especially if you've got fish eggs  
18 in the stream but I've just been working on writing  
19 up the work we did on sump fluids, and by and large,  
20 most of the ingredients are not very toxic, and as  
21 I said before, I think the most toxic ones have now  
22 been replaced by less toxic ones. There's quite a range  
23 of choice in detergents, and I think they've substituted  
24 low toxicity ones. So as far as toxicity goes, I'm  
25 not very concerned about that.

26 Q Would you recommend that  
27 if there are alternatives, that they be presented by  
28 the proponents that want to use them, so that a  
29 selection can be made of those ones which are both  
30 adequate and less harmful to the environment than





J.B. Sprague  
Cross-Exam by Bayly  
Cross-Exam by Hollingworth

1 others?

2 A Well I think that's  
3 already been done. That's my understanding.

4 Q Does that mean the others  
5 have been taken off the market or --

6 A I don't believe they're  
7 used up here anymore. According to -- well actually  
8 according to the student that did this work, who's  
9 now an oilspill coordinator for the government, these  
10 have been banned, effectively banned for northern  
11 use.

12 Q So we already have  
13 the legislation that --

14 A Well, I'm not sure it's  
15 legislated, but it's agreed to, and that's what counts.

16 MR. BAYLY: Those are all the  
17 questions I have. Thank you very much Dr. Sprague.

18 MR. HOLLINGWORTH: Mr. Commissioner  
19 I have one question that I overlooked when I was  
20 examining Dr. Sprague before. I wonder if I could  
21 put it to him?

22 CROSS-EXAMINATION BY MR. HOLLINGWORTH (CONTINUED):

23 Q Sir, if we could go back  
24 to page 10 of your evidence, the question of setting  
25 biological standard, one thing that concerns me here  
26 are how you take account in changes in the diversity  
27 index, that might occur from natural causes, and I'm  
28 thinking of a bank slumping upstream, that might  
29 have caused a considerable increase in the amount of  
30 soil in the water, something like that.



J.B. Sprague  
Cross-Exam by Hollingworth  
Re-Examination

1                   A     I just think you'd use  
2 the normal scientific procedure of having a control  
3 location upstream of operations, and compare.

4                   Q     I see. So you'd have one  
5 above the pipeline operation, one below, and if they  
6 check out to be the same, then that would be all right,  
7 or within this range.

8                   A     You're going to get seasonal  
9 changes anyway.

10                  MR. HOLLINGWORTH:  
                  All right. Thank you.

11 RE-EXAMINATION BY MR. SCOTT:

12                  Q     Doctor, just two questions  
13 that arise out of the questions Mr. Marshall asked you.  
14 You indicated in response to one of his questions that  
15 the blue book contained guidelines only, rather than  
16 dicta or standards themselves. Do I understand that  
17 the essence of the blue book is that while it contains  
18 guidelines, the guidelines are regarded, at least  
19 by the authors of the book, as appropriate for the setting  
20 up of standards or regulations?

21                  A     Yes, that's what I was  
22 trying to say yesterday, that these are scientific  
23 criteria, and they may be used as a basis for standards.

24                  Q     Yes. And the standards of  
25 course relate to the particular project?

26

27

28

29

30



J. B. Sprague  
Re-Examination

1 A Yes, they relate to the  
2 local situations.

3 Q Now, a second question.  
4 I should tell you first, that there are about 600  
5 water crossings on this project and there are probably  
6 about 1200 water bodies that are sufficiently close  
7 or parallel to the project that siltation is a possible,  
8 though, <sup>not</sup> necessary risk in construction.

9 Now, Mr. Marshall got you to  
10 agree that an aquatic -- qualified aquatic biologist  
11 of independence and integrity located at each of these  
12 sites would be a good way of approaching the problem.

13 Even assuming that were  
14 possible, is it your view that guidelines and standards  
15 are still required?

16 A Well, I wasn't quite  
17 sure I agreed to this person of integrity, judging  
18 each of these 600 cases.

19 Q Well, it's about 1800  
20 cases.

21 A If I did, I -- probably  
22 that wasn't my intention. I think you have to do this  
23 ahead of time and I think you have to start generaliz-  
24 ing, that you've got tundra streams; that you've got  
25 spring stream, you've got mountain streams, and you  
26 start lumping these into groups, and if it's necessary  
27 to have different standards, you do it by suitable  
28 groups of water bodies ahead of time.

29 Q Well now, let me take  
30 you to the problem of siltation about which Mr. Marshall





J. B. Sprague  
Re-Examination

1 asked you some questions. First of all, I should refer  
2 you to a book of recommendations filed this week by  
3 Dr. McCart which you may not have seen. But in it,  
4 there is a recommendation eight:

5 "Pipeline construction should be closely monitored  
6 so that any unacceptable level of siltation is  
7 immediately identified."

8 Now, bearing that in mind,  
9 I take <sup>it</sup> that your proposal is, as contained in the  
10 siltation section, is to provide two tests to measure  
11 what is acceptable or unacceptable.

12 A That's right.

13 Q Yes, and one test is  
14 the biological test that has been discussed.

15 A Yes.

16 Q The second test is the  
17 turbidity test?

18 A That's right.

19 Q Yes. Now, let's deal  
20 with the <sup>turbidity</sup> test. First of all, it can be used,  
21 I take it in winter or summer?

22 MR. HOLLINGWORTH: Sir, I fail  
23 to see how this is re-examination in any way, shape  
24 or form.

25 MR. SCOTT: : Well, if my  
26 friend doesn't want to hear it, I may not proceed  
27 with it.

28 THE COMMISSIONER: Well, let's--

29 MR. HOLLINGWORTH: We're back  
30 to the same old problem. I don't know why Mr. Scott



J. B. Sprague  
 Re-Examination

1 couldn't bring this evidence out in chief in the  
 2 accepted manner.

3 MR. SCOTT: It's out. It's  
 4 in the evidence, but I just thought that my friends  
 5 had concentrated on --

6 MR. MARSHALL: You just  
 7 wanted to cast a different light on the evidence.

8 MR. SCOTT: -- one of the  
 9 tests rather than the other and if Dr. McCart is going  
 10 to be recalled as Mr. Marshall tells me he is, to  
 11 comment on the turbidity test, I think it would be  
 12 nice to have this Dr.'s view about it on the record  
 13 clearly.

14 MR. MARSHALL: I didn't tell  
 15 you that.

16 MR. SCOTT: I'm sorry. If  
 17 he's not, then I won't trouble the panel with it.

18 MR. MARSHALL: I expect he'll  
 19 deal with sedimentation.

20 THE COMMISSIONER: Well, let's  
 21 get this evidence on the record, whatever it is and  
 22 if it leads to further cross-examination, then it does.  
 23 But this isn't a trial where we're seeking to ensure that  
 24 no one side obtains an advantage that in the circum-  
 25 stances would be denied the other side. Everyone's  
 26 looking for the same thing here, for the truth as  
 27 best it can be ascertained. So, ask the question and  
 28 if Mr. Marshall or Mr. Hollingworth want to ask further  
 29 questions in cross-examination, they'll be given that  
 30 opportunity.



J. B. Sprague  
Re-Examination

1 MR. SCOTT: Doctor, in  
2 your paper, and I won't touch on it, you've commented  
3 on the sediment test, which involves weighing and drying  
4 the sediments in water and you've made your comments  
5 about how that is done and the time frame in which it  
6 must be done. Then, you have posed what you call a  
7 turbidity test.

8 Now, I'd like to ask you to  
9 what extent in your judgement and experience, the  
10 turbidity/<sup>test</sup>produces the same results as the sediment  
11 test?

12 A Well, if I could go  
13 back just a step further, what you're really interested  
14 in is what's settling out on the stream bottom and  
15 the proper way to do that is to put little samplers  
16 into the bottom of the stream. Little bottles or  
17 cans or something and actually collect what's settling.

18 This is, again quite a  
19 difficult procedure and more or less impossible in  
20 the wintertime here. So the next step up is to  
21 use suspended material. That's not as good as catching  
22 what actually settles out, so you're already one  
23 step removed from<sup>what</sup> you're interested in and I did suggest  
24 going the third step to turbidity, and I know there are  
25 a lot of difficulties.

26 I've stressed that there are  
27 a lot of difficulties with this; getting a relationship.  
28 It may change somewhat with season in any one stream and  
29 it may be different from stream to stream.

30 But I think, if you look, there's





J. B. Sprague  
Re-Examination

1 going to be some general relationship that will be  
2 useful. But for a given type of stream and a given  
3 type of geological formation, you're going to get  
4 some general correlation between turbidity and suspended  
5 solids that will allow you <sup>to</sup> predict and it's simply a  
6 matter of having something that's practical.

7 We need to number the principal  
8 remains that we must have some sort of number for which  
9 to aim and I think turbidity is the only one.

10 I think it's reasonably  
11 predictable if you don't try to generalize to all types  
12 of water bodies. You're going to have to have maybe  
13 two or three categories.

14 Q Yes, well now if there is  
15 a discrepancy between a sediment test and the turbidity  
16 test, in which direction is the discrepancy going to lie?

17 A I don't quite understand  
18 that. Do you mean which is the better one?

19 Q No. Which is the most  
20 conservative one?

21 A Oh, it could be either way.

22 Q Now, what is the time  
23 frame in which a turbidity test can be taken?

24 A Oh, a few minutes.

25 MR. SCOTT: Those are all the  
26 questions. Thank you doctor.

27 THE COMMISSIONER: Any further  
28 questions arising out of the questions Mr. Scott put?

29 MR. HOLLINGWORTH: Not for  
30 the moment sir.



J. B. Sprague  
Re-Examination

1 THE COMMISSIONER: Well, that  
2 completes the evidence of Dr. Sprague and I want to  
3 thank you Dr. Sprague. May I say that we are especially  
4 grateful to you for sticking your neck out and offering  
5 specific recommendations regarding water quality because  
6 I happen to agree with you that it gives everybody  
7 something to shoot at and helps us to get down to  
8 brass tacks.

9 So, thank you very much for  
10 coming here.

11 A Thank you, sir.  
12 (WITNESS ASIDE)

13 THE COMMISSIONER: What  
14 time is it?

15 MR. SCOTT: Well, it's a  
16 quarter after 12, Mr. Commissioner. Mr. Peet is here  
17 and is ready to give evidence. His evidence will take  
18 about an hour to read and the Coppermine people, I  
19 understand, though I haven't met them myself, will  
20 be here after lunch.

21 Would you rather begin Mr.  
22 Peet, or would you rather have him return as he can  
23 do, the next week?

24 THE COMMISSIONER: Well, let's  
25 adjourn now. I think everyone's ready to adjourn,  
26 and come back at 2:00 and maybe you could have Mr.  
27 Ryder round up the Coppermine people over the lunch  
28 hour and if they are available to give evidence, --  
29 as a matter of fact, you might have Mr. Bayly see  
30 what he can do.

Presumably, they're connected



1 with COPE --

2 MR. BAYLY: No, they aren't,  
3 Mr. Commissioner. I have been asked this several  
4 times. The first time that I heard that they were  
5 coming was when Mr. Scott announced it, and I'm glad  
6 they're here, but they have nothing to do with the  
7 presentations that I have been making.

8 THE COMMISSIONER: Well  
9 maybe this should be on the record. Professor  
10 Jackson informed me before the Inquiry went to Paulatuk  
11 that a delegation from Coppermine wished to give  
12 evidence at Paulatuk. They asked that the Inquiry's  
13 charter go on from Paulatuk to Coppermine and bring  
14 them back to testify at Paulatuk.

15 I said that the Inquiry  
16 wasn't going to do that. That the reason the Inquiry  
17 was travelling around the villages was so that people  
18 wouldn't be forced to travel great distances to  
19 testify at the Inquiry and it seemed to me that  
20 Coppermine was beyond the range of our activities.

21 At any rate, I take it  
22 their interest is accountable in some measure to the  
23 appearance of a delegation from Coppermine at the  
24 formal hearings in Inuvik. I think it was in January,  
25 if I'm not mistaken.

26 At any rate, I told Professor  
27 Jackson to advise the people at Coppermine that we  
28 would not be prepared to use Inquiry funds or aircraft  
29 to transport persons to the Inquiry to testify; that  
30 they would have to make it on their own and apparently





1 they have done so, asssuming that they do appear at  
2 2 o'clock.

3 MR. SCOTT: Mr. Commissioner,  
4 I promised my friends that I would let them have the --  
5 as house leader, that I would let them have a note  
6 of the agenda to be followed in the next two weeks  
7 and I should perhaps do that now, as I may escape  
8 over lunch.

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1 The first thing  
2 is I anticipate that at the beginning of the next week  
3 we will complete our evidence, of which we have  
4 given my friends notice, by I would think, Wednesday  
5 night. Thereafter I would --

6 THE COMMISSIONER: That is the  
7 week of April 5th.

8 MR. SCOTT: That's correct, sir;  
9 that thereafter I would propose that Mr. Bayly's  
10 evidence about which there has now been a ruling should  
11 be heard and then Mr. Marshall should call -- Mr.  
12 Marshall or Mr. Hollingworth should call any reply  
13 evidence they have, and I would be grateful to both  
14 of them if they could let us know today, first  
15 whether they have reply evidence, and secondly, who  
16 it will be and generally on what subjects. Hopefully  
17 they'll be able to tell us more than fish or mammals.  
18 It would be helpful if they were able to tell us what  
19 issues the reply evidence will --

20 THE COMMISSIONER: The reply  
21 to whose evidence?

22 MR. SCOTT: I presume the  
23 Phase 2-3 evidence led by the participants and Commis-  
24 sion counsel. I understand Mr. Marshall has some.  
25 I don't know about Mr. Hollingworth. As I say, I would  
26 appreciate knowing, as I'm sure all participants would,  
27 if they have evidence, and knowing the issues to which  
28 it will be directed so that we will be able to prepare  
29 for it.

30 I would hope, though that



1 sounds like a fair task, that we would complete this  
2 phase by the end of the week of April 5th, and we would  
3 be ready to begin Phase 4 the following Monday or  
4 Tuesday.

5                               The procedure for Phase 4  
6 that has been agreed upon by the participants, subject  
7 to your views, sir, are that as I understand it, that  
8 Mr. Marshall and Mr. Hollingworth will jointly call  
9 the Northern Training Program evidence to begin. As  
10 I understand it, that's evidence in which they have  
11 a joint interest and they regard it as desirable to  
12 be called separate from the evidence each will call on  
13 Phase 4, so that we will know precisely what they're  
14 going to be fighting about.

15                              That following that, Mr. Bell  
16 will call the Brotherhood's evidence in the sequence  
17 that he has selected and that will take, of course,  
18 substantially more than that week.

19                              THE COMMISSIONER: All right,  
20 that sounds fine. Well, at two o'clock then we'll  
21 reconvene, at two o'clock this afternoon to hear the  
22 Coppermine delegation and after that, depending on --  
23 I'll leave this up to counsel -- have Dr. Peet read  
24 in his evidence. I'll leave that up to counsel. If the  
25 Coppermine delegation doesn't appear, then it seems  
26 to me we might use the time by reading in Dr. Peet's  
27 evidence. How would that be? All right.

28                              (PROCEEDINGS ADJOURNED AT 12:20 P.M.)  
29  
30





Peet & Hunt  
In Chief

(PROCEEDINGS RESUMED PURSUANT TO ADJOURNMENT)

MR. MARSHALL: Mr. Commissioner,  
Mr. Jakimchuk did complete the list of recommendations.  
I've distributed those to counsel and I've left a  
copy with Miss Hutchinson with the request that it be  
marked as an exhibit.

(MR. JAKIMCHUK'S LIST OF RECOMMENDATIONS MARKED  
EXHIBIT 518)

MR. RYDER: Sir, we have two  
witnesses for this afternoon. Roger Peet, who is  
presently head of the Fishery Management Division of the  
Fish Resources Section of Fisheries & Marine Services,  
Department of the Environment. He is stationed at  
Winnipeg and his evidence has been distributed to the  
participants and I believe left with Miss Hutchinson,  
and with him is W.J. Hunt, an enforcement officer in  
the same department as Mr. Peet, who has some experience  
as an enforcement officer in the northern part of the  
Northwest Territories.

(QUALIFICATIONS & EVIDENCE OF R.F. PEET MARKED  
EXHIBIT 519)

(FISHERIES ACT MARKED EXHIBIT 520)

(N.W.T. FISH REGULATIONS MARKED EXHIBIT 521)

ROGER F. PEET,  
W.J. HUNT, sworn:

DIRECT EXAMINATION BY MR. RYDER:

Q Perhaps I can begin, sir,  
by asking you, Mr. Peet, to outline briefly your  
professional experience which I see is set out on page  
10 of your -- perhaps I should preface the evidence of



Peet & Hunt  
In Chief

1 Mr. Peet, sir, by advising the Inquiry that both Mr.  
2 Peet and Mr. Hunt are employees of the Government of  
3 Canada and of course their evidence today represents  
4 their own personal views and not that of the Government  
5 of Canada. Now, Mr. Peet, if you could just outline  
6 briefly your academic background and your professional  
7 experience.

8 WITNESS PEET: Yes. I went  
9 to Memorial University in Newfoundland and got my  
10 Bachelor of Science and then joined the Department of  
11 the Environment as a private biologist in 1965, and  
12 continued on in that capacity. While there I returned  
13 to Memorial University and did some graduate courses.

14 In 1972 I left the Newfoundland  
15 region and came to the central region as the senior stream  
16 management biologist of the Northwest Territories, and  
17 in 1974 I competed for the position which I presently  
18 hold as head of the Fishery Management Division.

19 Q And what is the relation-  
20 ship between you and Mr. Hunt? M r. Hunt, do you work  
21 in Mr. Peet's office?

22 WITNESS HUNT: Yes.

23 WITNESS PEET: Mr. Hunt is  
24 the fishery officer in charge of the Western Sub District,  
25 Inuvik, he comes under the district manager for the  
26 Department of Environment here in Yellowknife. We work  
27 very closely together because our fields of duties  
28 overlap. I look after the management of fish; he  
29 looks after the enforcement of it, and we work sort  
30 of hand in glove in this regard.



Peet & Hunt  
In Chief

1 Q All right. Now, Mr. Hunt,  
2 I wonder if you could just, for the use of the Inquiry,  
3 give a brief statement of your professional activities  
4 in the Northwest Territories at the moment?

5 WITNESS HUNT: I've been  
6 employed as a Fisheries officer with the Fisheries &  
7 Marine Service for 4½ years. These years have been  
8 served in the Northwest Territories; more specifically  
9 my area of responsibility includes Banks Island to the  
10 mainland area north to Tuk, east to Paulatuk, and west  
11 to the Yukon border, and south to Norman Wells.

12 Q And what, sir, are your  
13 responsibilities in that area?

14 A My responsibilities are  
15 to enforce the Fisheries Act and all the other Marine  
16 Mammal Regulations in the Northwest Territories, and the  
17 Northwest Territories Fisheries Regulations.

18 Q And before Mr. Peet  
19 reads in his evidence, sir, I wonder if his statement  
20 of evidence and the appendixes attached to it can be  
21 marked as an exhibit to the Inquiry?

22 Mr. Peet, would you begin with  
23 your evidence, please?

24 WITNESS PEET: Yes. My brief  
25 concerns the probable effects of pipeline construction  
26 under domestic fisheries in the Mackenzie Valley.

27 Some of these effects, which  
28 I discuss below, I think will lead to developments  
29 which will be of direct concern to the Northwest  
30 Territories District Office and the Fisheries Marine





Pest & Hunt  
In Chief

1 Service which I mentioned earlier. This office is  
2 responsible for enforcing the provisions o f the  
3 Federal Fisheries Act and pertinent regulations promul-  
4 gated under that Act, such as the Northwest Territories  
5 Fisheries Regulations, and it is also important to the  
6 division that I am head of, the Fishery Management  
7 Division of the Fisheries Resources Section of the  
8 Fisheries Marine Service whose headquarters is in the  
9 Freshwater Institute in Winnipeg. Those two items, the  
10 N.W.T. Fisheries Regulations and the Fisheries Act I have  
11 here and you might want to have it put in as an exhibit.

12 Q Is it the practice of the  
13 Inquiry to make the laws of any province or territory  
14 an exhibit? If it is, I'm content that they be marked  
15 as an exhibit.

16 THE COMMISSIONER: Well, I  
17 think we should make them an exhibit in this instance.

18 A It is the responsibility  
19 of the Fishery Management Division to develop, operate  
20 and maintain in a management program for the fish  
21 resources of the Northwest Territories, and this is in  
22 accordance with the provisions of Section 34 of the  
23 Federal Fisheries Act. The program is implemented by  
24 formulating, recommending, and putting into force manage-  
25 ment controls which are specific to sports and commer-  
26 cial exploitation, but not for the domestic exploitation  
27 which I point out below. These controls are based  
28 upon biological information collected under my division's  
29 auspices or other -- help from other people such as the  
30 Northwest  
Territorial Government and the controls are arrived at



Peet & Hunt  
In Chief

1 by close consultation with the District Office on  
2 enforcement officers for the Fisheries & Marine Service,  
3 and the Northwest Territorial Government.

4 The usual vehicles of controls  
5 are in variation orders to the Northwest Territories  
6 Fishery Regulations, and changes to these regulations  
7 and the maintenance of the various schedules of these  
8 regulations which are appended on the back.

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Peel, Hunt  
In Chief

1 Activities of the division  
2 and the rationale used for the management of the  
3 fisheries resource in the N.W.T. derive, in a large  
4 part, from the recommendations of the Federal Territorial  
5 Task Forces on fisheries development in the Northwest  
6 Territories. I have copies of this document with me  
7 here for reference.

MR. RYDER:

8 Q Perhaps that could be  
9 made an exhibit as well.

10 THE COMMISSIONER: Yes.

11 A These recommendations  
12 are contained in the publication "Where to Now?"  
13 and, well, I've offered these as evidence.

14 The recommendations have  
15 important implications as to the response of the  
16 District Office and the Fishery Management Division to  
17 various aspects of pipeline construction associated  
18 with exploitation of the fish resource in the Mackenzie  
19 Valley.

20 In summary, the salient points  
21 of the recommendations of the task force which are  
22 germane to the possible effects of pipeline construc-  
23 tion on domestic fisheries are as follows:

- 24 1. The harvest of fish for domestic purposes should  
25 take precedence over other forms of exploitation.  
26 The domestic needs of the indigenous people must  
27 be met and the option to preserve their traditional  
28 way of life should be maintained. Only the  
29 harvestable stock over and above these needs should  
30 be used for commercial or sports developments.





Peet, Hunt  
In Chief

- 1 2. Fisheries development should be for the benefit  
2 of the long-term residents of the north. Current  
3 fisheries should be reassessed and future develop-  
4 ments should definitely meet this aim. Also,  
5 before any commercial or sports venture is begun  
6 in an area, the domestic requirements of the  
7 native people should be assessed and subsequently  
8 protected.
- 9 3. Any commercial or sports developments should meet  
10 the following criteria:
  - 11 a. There has to be an adequate supply of fish  
12 and that's to say it has to be decided whether  
13 a potentially harvestable resource exists,  
14 and if there would be sufficient fish in  
15 excess of domestic need to make the harvest  
16 worthwhile .
  - 17 b. The operation has to be economically sound in a  
18 long-term sense and to keep development options  
19 open, exploitation methods which depress the  
20 the resource base for extended periods should  
21 be discouraged.
  - 22 c. In light of the emphasis on preserving the  
23 option for the native people to preserve their  
24 traditional way of life and to protect their  
25 domestic harvest, the wishes of long-term resid-  
26 ents of the Northwest Territories should be a  
27 deciding factor as to whether a commercial or  
28 sports development goes ahead. That is to say,  
29 the residents should want it.
- 30 4. The decision as to the type of development to take



Reel, Hunt  
In Chief

1 place should be the result of a consultative process  
2 between the agencies involved, the Fisheries and  
3 Marine Service and the Northwest Territorial  
4 Government.

5 From these above points, it  
6 is evident that preservation of the option to domestically  
7 fish has been identified to be of first priority as  
8 far as fishery management in the territories is con-  
9 cerned. However, there are no control -- or there is  
10 no control of domestic exploitation. This is underlined  
11 by Sections 21 to 25 of the Northwest Territory Fishery  
12 Regulations which cover the domestic fishing.

13 Under these sections, domestic  
14 fishing privileges are granted to all the native persons  
15 who are at least one-quarter Indian or Inuk blood. They  
16 are allowed to fish by any means, at any time of the  
17 year and in any body of water.. These fisheries are not  
18 regulated by quota, nor do the participants require a  
19 licence. When your present regulations were passed in  
20 1974, a permit system was introduced as a means to  
21 enable the department to get a more accurate assessment  
22 of the domestic harvest, which is a very difficult job.

23 Also, this was a heck of  
24 a sentence -- I'm trying to make good English out of it. Also  
25 the marking of nets would allow the department to  
26 differentiate for enforcement purposes, between domestic  
27 and commercial gear. This particular regulation met  
28 with considerable negative reaction from the native  
29 people and is not being administered until other alterna-  
30 tives are being investigated.



Pect, Hunt  
In Chief

1                   Before I proceed further with  
2 this brief, I wish to point out that the Fishery  
3 Management Division has not been directly involved  
4 with assessment programs in the Mackenzie Valley. I  
5 don't wish to appear as a masquerader or a person who's  
6 done a lot of work, because my opinion expressed here  
7 is based upon the body of work that's already been  
8 offered as evidence here on and in the reports that  
9 I've appended in the back.

10                   Rather, the division has  
11 relied on the work of the Resource Impact Division, in  
12 particular of the Fisheries and Marine Service, surveys  
13 by Fisheries and Marine Service Fishery officers such  
14 as Mr. Hunt and the reports of other agencies connected  
15 with the assessment of the Mackenzie Valley fish resource  
16 to provide biological and fishery survey information.

17                   This is because the reason  
18 we've taken this option, is because of the recommended  
19 priority areas for the fisheries development -- for  
20 fishery development listed by the task force report which  
21 I've tabled and the low level of commercial and sports  
22 development in comparison to other parts of the Terri-  
23 tories.

24                   I refer here to Appendix  
25 tables three and five and what I've done in my brief  
26 I'm presenting, is append summaries of the type of  
27 information that have largely helped me to form my  
28 opinions which I'm presenting in this brief. For  
29 instance, appendix table three gives you a summary of  
30 the commercial fishing areas pertinent to the Mackenzie





Peet, Hunt  
In Chief

1 Valley Pipeline route.

MR. RYDER:

2 O That's at page 12 of  
3 your evidence?

4 A I'm sorry, page 12 and  
5 appendix five -- it gives a list of the sport fishing  
6 lodges and natural facilities of the sports fishing  
7 areas along the Mackenzie Valley pipeline route.

8 What I've put those in for,  
9 is I made the statement that by comparison, the level  
10 of commercial and sports development was low and this  
11 was just to illustrate my point and why I had that  
12 opinion. Just to recapitulate that sentence, I'll  
13 say it again.

14 This is because the recommend-  
15 ed priority areas for fishery development listed in  
16 the task force and the low level of commercial and  
17 sports development as shown in appendix tables three  
18 and five, along the Mackenzie Valley in relation to the  
19 domestic fishery, which is entirely; to make a point,  
20 a different kettle of fish. It's very important.



Peet, Hunt  
In Chief

Consequently the opinions and recommendations I discuss below are based on careful consideration of the data of others, primarily the references I list in Appendix 7, not on the original work by the Division. However, the people I'm responsible for do have some expertise in determining the harvest level of domestic fisheries. A report by Mr. W. Bond of the Division, put out in 1973, concerning the fishery at Lac la Martre deals with an assessment of domestic harvest in that area, and has been quoted by Bissett, 1974 and Withler, 1975, which have dealt with the question of domestic fisheries in the Mackenzie Valley. In addition, the Division is currently involved in monitoring the domestic fishery along the south shore of Great Slave Lake.

Concerning the domestic fishery, many authors, among them Abrahamson, Bissett, Higgins, Hunt et al, Stein, Villiers, and others that I have appended in Appendix 7, have pointed out the importance of domestic fishing both past and present, in providing a source of food for native people along the Mackenzie River Valley. The significance at any given time varies with the economic conditions in a given community, and the availability of alternate food sources. Domestic fishing is nevertheless an activity that is important for both social and economic reasons in all the communities along the Mackenzie River even with an increasing number of native people turning from the traditional subsistence way of life to dependence on a wage economy.



Peet, Hunt  
In Chief

1                   In general, fishing activities  
2   are especially important in the summer, when trapping  
3   has ceased and hunting is difficult, although autumn  
4   and winter fisheries are also important in gathering  
5   a winter supply of fish, especially for dog food. Fish  
6   are usually caught by gill net. The fishing sites are  
7   usually located at the mouths of rivers and streams,  
8   tributary to the Mackenzie and larger waterways, such as  
9   the Peel and Liard Rivers. Back eddies along the main  
10   Mackenzie River in areas where current and debris will  
11   not destroy the nets, and are important, as are various  
12   channels in the Mackenzie Delta. These locations, mouths  
13   of rivers, back eddies and delta channels, are usually  
14   strategic points effectively situated to harvest known  
15   runs of fish which migrate at specific times --  
16   migrate past those points at specific times of the year.  
17   In addition, lakes in close proximity to settlements  
18   or along traditional trap lines are also fished.  
19   Some locations are used every year, others intermittently;  
20   some are used by a number of families, some by one  
21   family group, sometimes they're used one year and  
22   not another. Usually there are specific fishing  
23   locations associated with each community along the  
24   river valley, and the most favoured sites, that is,  
25   the most used, most frequently by most people, are  
26   generally not far from the main settlement.

27                   The main fish species of  
28   importance to domestic fisheries are given in appendix  
29   2, as I understand them, and the main domestic  
30   fishing areas, given species by areas and fishing





Peet, Hunt  
In Chief

1 periods, are all summarized in appendix table 6. Both  
2 these tables were compiled from the references I  
3 list --

4 Q Stopping just  
5 a moment, Mr. Peet, it may be useful if you could  
6 review with us the contents of your table 2 and  
7 appendix table 6.

8 A Appendix -- I appended  
9 appendix 2 to give a summary of the major fish  
10 species of importance in the Mackenzie Valley, by  
11 area, and I list the references I used to compile this  
12 information. The purpose of this table is to show  
13 those species, with their scientific name and common  
14 name. Their value to commercial and sports and  
15 domestic fisheries by area, lower middle and upper  
16 Mackenzie. They give some idea of their spawning  
17 time if you'd like to make reference of that. The  
18 migrational pattern, that is, if they migrate upstream  
19 or downstream, or <sup>if</sup> they're sedentary by species; the  
20 feeding habits; and also the sensitivity. And this  
21 sensitivity column is offered by me as a via reading  
22 of the other people concerned with these species, not  
23 to provide an index of the more important or less  
24 important species, you know, you can put a number on  
25 it, but rather just to show that, for instance, in the  
26 case of the coney, this fish, if something were to  
27 happen to its environment, would probably be very  
28 sensitive to silt, or heavy fishing pressure. It's  
29 just a relative index for me to discuss these fish in  
30 relation to one another.



Peet, Hunt  
In Chief

1 Q What do you mean by stress,  
2 Mr. Peet?

3 A Stress to me would mean  
4 something that is <sup>not</sup> in the natural condition of the  
5 fish, that it would have to face. There are certain  
6 thresholds in an animal's behavior, once you go, it  
7 can, either for short periods of time or by avoiding  
8 it, it can vary within certain tolerances. Once you  
9 go over those tolerances, various things, not natural  
10 to the animal's behavior, could possibly happen, and  
11 what I'm saying here is if you suddenly get a wall  
12 of silt or something like that come down on a fish  
13 that was normally used to a clear-water condition,  
14 it had no way to escape, you would probably get  
15 something very abnormal happening to that fish in  
16 terms of its behavior, or possibly its eventual  
17 survival.

18 Q Could you take us through  
19 appendix 6 before you go on? I believe that's at  
20 page 20 of your evidence.

21 A Appendix 6, I append  
22 it to show a summary of the domestic fishing areas,  
23 the species caught in those particular areas, the  
24 periods of fishing. This table is compiled largely  
25 after Bisset, 1974, and Stein and et al, and I don't  
26 put this out as being in any way a complete listing  
27 of the important domestic fishing areas in the  
28 Mackenzie Valley. Rather it's there as an indication  
29 of the numbers and places and types of fisheries  
30 you would find up and down that valley.



Peet & Hunt  
In Chief

1 Actual and projected population  
2 by ethnic groups and communities for the period 1971 to  
3 1981 is given by Hunt et al in Appendix D, Table 2 of  
4 his report. Reference to this source allows insight  
5 into the number of native people per community in  
6 relation to the fishing areas in Table 6. What I  
7 stuck that in there for, there are so many communities  
8 because of the increasing number of white people that  
9 might be associated with it, there seems to be a trend  
10 in some authors' minds that there might be a turning  
11 away by the native people from their traditional way  
12 of life, and if you wish to put an index on that, it  
13 is possible in my mind to do it by reference to this  
14 table by Hunt which I mentioned, and these areas that  
15 I show in the appendices. It's not an important  
16 point with me, I'm just bringing it out that you could  
17 put this type of indices on it if you wish.

18 It is exceedingly difficult  
19 to quantify domestic fish production, and this is true  
20 for the Mackenzie River domestic fishery as well as  
21 elsewhere. Fish camps are spread over wide distances,  
22 there is no one strategic location to assess the  
23 catch as there usually is in a commercial fishery,  
24 and there is no reason for domestic fishermen to quan-  
25 tify production in terms of species or pounds harvested,  
26 which biologists such as myself would like them to tell  
27 us. Also, utilization of the fish is virtually  
28 complete with offal and coarse fish being fed to the  
29 dogs. As noted above, there is also a reluctance on the  
30 part of the native people to let anyone interfere or





Pect & Hunt  
In Chief

1 pry into their domestic fishing activities, and this  
2 cuts down on the accuracy of domestic<sup>fishery</sup> production esti-  
3 mates.

4 Withler (1975) provides a  
5 review of production figures compiled from various  
6 sources, and Bissett also gives production figures in  
7 Appendix E of his report.

8 In order to put the fishery  
9 into perspective -- or the domestic fishery into  
10 perspective in terms of pounds, I offer the following  
11 table after Hunt et al , and this is sort of summarizes  
12 the estimated domestic harvest for 1972.

13 This table shows that the  
14 estimated domestic fish harvest along the Mackenzie  
15 Valley for that period in terms of the Lower, Central and  
16 Upper Mackenzie, the species we're talking about, and  
17 the relative pounds.

18 In addition, the following  
19 harvest estimates are provided to give an example of  
20 community use of the domestic catch.

21 At Aklavik, a survey of  
22 domestic fishery in Aklavik was conducted by Fishery  
23 Officer Hunt in 1973, and this revealed that approximate-  
24 ly 294,000 estimated pounds of fish were consumed  
25 annually in that community by 677 people and 132 dogs.  
26 The dogs consumed close to 75% of this total.

27 At Trout River, another  
28 survey by Fisher Officer provided an estimate of 123,000  
29 pounds of annual fish harvest by 45 people. The 50  
30 dogs in that community again consumed about 75% of



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In Chief

1 this total.

2  
3 Table 1 points out the fact  
4 that even though the domestic fishery is important  
5 throughout the entire Mackenzie Valley, the greatest  
6 concentration of domestic fishing is found along the  
7 Peel River and the Mackenzie Delta area. The estimated  
8 annual harvest for 1972 in Table 1 shows that that har-  
9 vest was 68.1% of the total.

10 Sports and commercial fisheries.  
11 Exploitation by sports and commercial fishing is not  
12 heavily developed in the Mackenzie Valley area. If  
13 you want to put a number on that, I mean that in compari-  
14 son to other parts of the Territories. Appendix Tables  
15 3 and 4, which I've alluded to, list the commercial  
16 fishing areas, species and quotas for the area, and  
17 Appendix Table 5 lists the facilities and species  
18 important to sports fishing. This information is provi-  
19 ded to compare the areas where this activity occurs with  
20 the domestic fishing areas given in Appendix Table 6,  
21 and also in light of the guidelines of the task force  
22 on fishery development in the Northwest Territories  
23 which I've already spoken about.

24 When referring to this list  
25 of commercial quotas for the area, it should be remember-  
26 ed that all these areas are closed on Schedule 5 of the  
27 Northwest Territories Fishery Regulations. Possibly I'd  
28 better explain that a little more. The Fishery Regula-  
29 tions have attached various schedules which pertain to  
30 certain topics, one of which is Schedule 5, which lists  
the commercial fishing areas, the species, the times,



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1 the quotas , the net sizes that have to do with that  
2 particular fishery. The season on there is closed and  
3 what happens is if a person in the Territories wishes  
4 to have a commercial fishery, they would make a request  
5 and we would entertain it, we would look at it in  
6 various ways, and if it is approved, there is a variation  
7 order to the schedule which says that for this parti-  
8 cular year or this particular time period, this fishery  
9 with allowance (inaudible) and the number of the  
10 variation in the schedule would be open for commercial  
11 fishing for this year. It's a measure of control that  
12 you can shut a fishery if need be for various reasons,  
13 or you can open it. So all those quotas listed in  
14 Appendix 3 are not quotas that are currently being  
15 fished. They list the ones that have a potential that  
16 could possibly be fished, but at any given time in any  
17 given year, any number of these could be fished.  
18 The requests are made to my department, we make the  
19 variation order that would open them to the people who  
20 want to fish these areas.

21 To date the single largest  
22 commercial activity in the area that I'm discussing  
23 has been the Holmes Creek fishery in the Mackenzie  
24 Delta. The report by Barlishen & Webber, which I refer  
25 to in the appendix, covers the history of this commercial  
26 development and serves to point out the problems  
27 associated with commercial development in the Territor-  
28 ies in general and the delta in particular.

29 The single area, which has the  
30 largest potential for increased commercial development,





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1 is the Mackenzie Delta. At least that's what I can  
2 determine from the information that's open to me.  
3 Even so, a marketing study by McLeod showed that most  
4 -- the most limiting factor to any commercial fishery  
5 development in this area is transportation. For the  
6 foreseeable future the potential for the delta commercial  
7 fishery, as well as others in that area, lies in selling  
8 the product locally.

9 To provide a framework for  
10 such a development, the Fishery Management Division  
11 divided the delta into zones and formulated quotas  
12 in accordance with the guidelines of where to now the  
13 fisheries development report I've alluded to. We did  
14 this in anticipation of a request for an increase in  
15 commercial fishing in that area. The areas of the  
16 Mackenzie Delta I'm referring to are defined in Appendix  
17 4 and again the quotas are given in Appendix 3, if  
18 you wish to refer to them.

19 At present the sports fishery  
20 --

21 Q Mr. Peet, maybe you could  
22 look at Appendix 4 so that you can describe and you  
23 know where these areas are.

24 A All right. Appendix 4 --

25 Q It's at page 13.

26 A -- is an excerpt from  
27 Schedule 2 of the Northwest Territories Fishery  
28 Regulations as they are this year, and what they do  
29 is define the areas of the Mackenzie River Delta and  
30 lower Mackenzie River that by zone and again if you



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1 refer to the Appendix 3 in front of it you see the  
2 Mackenzie Delta and Area 1, Area 2, Area 3, Area 4,  
3 with certain species and quotas attached. Area 1 is  
4 defined in Appendix 4 as -- I won't read the whole  
5 thing but it's a geographic thing, you draw lines around  
6 it and that's the area you're talking about.



Peet, Hunt  
In Chief

1 Q Thank you.

2 A At present, the sports  
3 fishery is not competitive with the domestic fishery  
4 due to its small size. The species fish in the small  
5 non-native population that will be interested in sports  
6 fishing.

7 I've provided the material in  
8 the foregoing sections in order to put the situation  
9 up to and including the present, into perspective  
10 regarding the use of fishery resource in the Mackenzie  
11 River Valley. The point that emerges is that even  
12 with the social changes that have been documented, that  
13 increased transportation, communication and availability  
14 of money, etc., has brought to these communities along  
15 the Mackenzie River Valley; domestic use of that  
16 resource is still a highly significant activity in  
17 terms of food production and is likely to continue  
18 to be so, in my opinion, to the native people.

19 The effects of pipeline  
20 construction. Pipeline construction in the Mackenzie  
21 Valley will affect the communities, the native people  
22 and the fish resource in several ways. These have been  
23 listed by a number of authors including Bissett , Stein  
24 and Gemini North that I've listed in appendix seven.

25 One can consider the effects  
26 which the pipeline can have on the fish resource or  
27 the environment in which it lives during and after con-  
28 struction. The include the possible adverse effects  
29 associated with siltation or removal of spawning gravel,  
30 blocking of fish migration, destruction of rearing areas





Peet, Hunt,  
In Chief

1 during construction, chemical contamination of the  
2 aquatic environment from spills after construction is  
3 complete, and these will also provide, probably affect  
4 domestic fisheries if they change the nature of the  
5 fish resource or the environment.

6 Primarily, assessment of the  
7 impact of construction activity on the fish resource,  
8 is the responsibility of the Resource Impact Division  
9 of the Fisheries and Marine Service. My division, the  
10 Fishery Management Division is more concerned about  
11 the resulting impact on the use of the resource.

12 Stein, et al, modified by  
13 Jessop and others pose recommendations related to  
14 pipeline construction and operation designed to eliminate  
15 or minimize these effects that I've listed above on  
16 the fish resource. Stream systems where the fish  
17 resources are biologically sensitive to pipeline con-  
18 struction should be avoided and these are listed.

19 Species which will probably be  
20 most affected by construction activity and seasonal  
21 times when the fish resource is most biologically sen-  
22 sitive to construction are also given. Brunskill , et  
23 al, makes recommendations designed to protect the zoo-  
24 benthic communities of streams during construction  
25 activities.

26 The reason I put that in there,  
27 is that although my primary concern is with fish,  
28 zoobenthic serve as food sources for fish and if there's  
29 something happens to the bottom, and there's quite  
30 a problem within some areas, then it probably would



Peet, Hunt,  
In Chief

1 affect the behaviour of the fish, which in turn could  
2 affect the domestic fishery.

3 In appendix table two,  
4 which I've gone over previously, I have briefly out-  
5 lined the spawning periods, migration timing, feeding  
6 habits and probable sensitivities of the major fish  
7 species of importance to the people of the Mackenzie  
8 Valley and these are after the authors I've listed.

9 If the recommendation of  
10 Stein and subsequent modifications by Jessop are  
11 followed, in my opinion, the possible detrimental  
12 effects to the fishery resource will be kept to a  
13 minimum under normal circumstances.

14 In particular, pipeline river  
15 crossings, work camps and staging areas should not  
16 be located near or at domestic fishing sites. Those  
17 which are because circumstances will not allow any  
18 other course of action, should warrant stringent pre-  
19 cautions to minimize possible effects on the resource  
20 or fishery.

21 Based on the above, I feel  
22 that if a pipeline is routed so as to avoid the major  
23 domestic fisheries, there should be little or no direct  
24 interference or conflict between the two. However,  
25 care should be taken to avoid insidious effects not  
26 readily apparent. For example, blockage of the migratory  
27 runs, say in the delta area, may have effects on the  
28 domestic fishery far removed from the immediate site  
29 of the disturbance, for instance, along the Peel River.

30 Construction activities will



Pect, Hunt  
 In Chief

1 also affect the people in the  
 2 area either directly during construction by interfering  
 3 with their traditonal pursuits, such as domestic  
 4 fishing, or indirectly by changing the way of life,  
 5 or by bringing in more people who will make demands on  
 6 the resource either for recreational or food purposes.

7 Some of the main concerns  
 8 of the Fishery Management Division and the District  
 9 Office will be with the spinoffs arising from the  
 10 influx of a large number of people involved in the  
 11 construction of the pipeline or related activities.  
 12 This could lead to an increase in sports and commercial  
 13 fishing, possibly to the detriment of the domestic  
 14 fishery , which is identified to me as being of the  
 15 prime importance.

16 Arctic Gas has stated that  
 17 as a matter of policy, pipeline personnel will not  
 18 be permitted to engage in fishing. However, it should  
 19 be recognized that enforcement of such a regulation will  
 20 be up to the companies involved as Fisheries and Marine  
 21 Service cannot deny the sale of sports fishing licences  
 22 to any persons providing they abide by the appropriate  
 23 regulations.

24 Even if this policy were  
 25 inaugurated, and enforced, it would not totally solve  
 26 the issue as there will undoubtedly be a large number  
 27 of people travelling in the Mackenzie Valley as a result  
 28 of construction activity, who are not employed by the  
 29 pipeline companies.

30 Also, with the lack of alternate





Pect, Hunt  
In Chief

1 recreational outlets, it seems to me that there is  
2 no reason not to permit sports fishing in those areas  
3 where adequate fish stocks are available and there would  
4 be no conflict with the native people. The recommenda-  
5 tion of the task force on fisheries development in  
6 the Northwest Territories state that more considerations  
7 should be given to encouraging the development of sports  
8 fisheries, as these can yield a far greater return for  
9 each fish harvested to the people in the area and this  
10 would occur generally with less stress than a commercial  
11 fishery development or such on the fisheries resource.

12 It would seem that in the light  
13 of the wish by the native people in some instances to  
14 convert the fish resource to a monetary base, it would  
15 be beneficial to promote sports fishing activities.  
16 What I'm trying to get at there is those that come  
17 up here and work and are exposed to this type of  
18 recreation in the Territories, they may return again  
19 to the benefit of the people in the area as tourists  
20 because of their previous sports fishing experiences.

21 It should be recognized, how-  
22 ever, that the decision to proceed with any develop-  
23 ment in a sports or commercial sense is the prerogative  
24 in my opinion of the native people in the areas con-  
25 cerned.

26 If adequate safeguards are  
27 devised to meet the increase in sports fishing, such  
28 activity should not affect the domestic fishery. Such  
29 safeguards could include more stringent daily catch  
30 and possession limits, increased surveillance of sports



Pect. Hunt  
In Chief

1 activities in the vicinity of settlements and work  
2 camps. If need be, special areas designated under the  
3 N.W.T. Fishery Regulations can be set aside solely for  
4 domestic fishing purposes.



Peet, Hunt  
in Chief

1                                    If conflicts between sports  
2 and domestic use do occur, they will probably be  
3 connected with people-oriented problems, and when  
4 I say people-oriented problems, I don't mean that in  
5 a light sense. I mean that that would be a very large  
6 part of what the problems are. I'm a biologist, I  
7 look at fish more in terms of what people -- you know,  
8 how many they can take from that particular population.  
9 I'll begin that sentence again. If conflicts  
10 between sports and domestic use do occur, they will  
11 probably be connected with people-oriented problems,  
12 not overharvest of the resource by sports fishing,  
13 since the species most attractive to anglers are  
14 not usually the major species of importance to domestic  
15 fishermen; and there are exceptions to this, because  
16 I do know that around -- I think it's around Fort  
17 Good Hope and these areas, people catch grayling quite  
18 a bit which is also a species that's most attractive  
19 to anglers, but in general the species that sports  
20 people go after are not necessarily the ones that  
21 are very important to domestic -- people fishing  
22 domestically.

23                                   This is another reason in  
24 my opinion why it might be a good idea from the  
25 point of view of best use of resource for the native  
26 people to consider promoting sports fishing activity  
27 for their own benefit.

28                                   There are very few commercial  
29 fisheries presently in operation in the Mackenzie  
30 Valley and those that are for the most part are





Pect, Hunt,  
In Chief

1 relatively small, that are just being as I said earlier  
2 the fishery in the Holmes Creek area, the Mackenzie  
3 River delta.

4 It is becoming more common  
5 however, for domestic fishermen to enter into the local  
6 sale of their excess fish as a means of income. This  
7 then becomes a commercial venture and is increasingly  
8 being regulated as such. With the large number of  
9 personnel involved in pipeline construction, it is  
10 probable that some domestic fishermen may see this  
11 as a market for their catch, and request commercial  
12 quotas. If it evolves that native persons do want to  
13 set up commercial fisheries in the fashion outlined,  
14 then they have to make a choice of curtailing their  
15 domestic activities in some areas, or to satisfy their  
16 domestic requirements from the commercial quota itself.

17 However this is a decision that  
18 must be left up to the people concerned, in my opinion,  
19 because as stated in the Task Force on Fisheries  
20 Development, it is the policy of the department I  
21 represent that a commercial fishery can only be  
22 established where it will not interfere with or  
23 detract from existing domestic fisheries. Such  
24 developments may only be of a short-term economic  
25 benefit for the native people concerned, and this  
26 should be recognized. However, if properly regulated  
27 the development of commercial fishery in this sense  
28 should have no detrimental effect on the fish population  
29 concerned, if it's properly managed.

30 The main problem for the Fishery



Peet, Hunt  
In Chief

1 Management Division will be to set realistic quotas which  
2 will satisfy the increased demand, if it occurs, and  
3 at the same time protect the resource from overharvesting.  
4 This will especially be true in the case of the  
5 migratory fish species that are listed in the appendix  
6 table 2. What I mean there is that it's a lot harder  
7 to set quotas and regulations for fish that move, rather  
8 than ones that stay sedentary in the same spot.

9                   These species, migratory  
10 species, pose additional problems as because the same  
11 population may be harvested at more than one location  
12 and more than one time, and more than one time in  
13 the season. The same remarks considering insidious  
14 effects that I made above are -- would not be  
15 immediately -- readily apparent where it occurred,  
16 would especially apply to the migratory species.

17                   So my conclusions are that  
18                   of  
19 domestic fishery is of primary importance to the native  
20 people of the Mackenzie Valley and should be protected  
21 either from environmental disturbances or increased  
22 use of the resource by other means than domestic  
23 fishing. The option to change from domestic use to  
24 commercial or sports harvest should remain with the  
25 native people concerned.

26                   If the proper safeguards are  
27 attached to pipeline construction and favoured domestic  
28 sites are avoided, there should not be much of a  
29 detrimental effect on domestic fishing.

30                   There is no reason to ban,  
in my opinion, sports fishing for the construction



1 period, but more stringent catch possession limits may  
2 be required and more on the spot enforcement will be  
3 needed to ensure that these regulations are being  
4 observed. If conflicts do arise, then protected areas  
5 for domestic fishing can be designated.

6 Some incentive may exist to  
7 encourage more commercial fisheries. If this does  
8 occur then the guidelines of the Task Force on fishery  
9 development in the Northwest Territories, would be  
10 applied to ensure that the option to fish domestically  
11 is kept open and that the wishes of the native people  
12 are considered regarding alternative use in the  
13 sports or commercial sense of the fishery resource.

14 MR. RYDER: Mr. Marshall, do  
15 you care to start in?

16 MR. CARTER: I have a couple  
17 of questions, Mr. Commissioner.

18 CROSS-EXAMINATION BY MR. CARTER:

19 Q Mr. Peet, as I understand  
20 it, it's your opinion that the Mackenzie Delta can  
21 meet the demand put on it presently by domestic  
22 fishing, and in addition could support increased  
23 commercial fishing. Is that correct?

24 WITNESS PEET: What I'm saying  
25 is from my knowledge of the stuff that's been produced,  
26 those quotas that we have listed in the schedule 5  
27 now, plus the current level of domestic harvest, it  
28 seems to me that, yes, this would be safe. I would,  
29 without more intense biological assessment of the  
30 various populations there, be extremely nervous as a





Pect, Hunt

Cross-Exam by Carter

1 manager to increase any commercial quota over that --  
2 that's been named in that schedule.

3 Q I see. But you see no  
4 reason to ban sport fishing, even though Arctic Gas  
5 has stated it's policy is to not allow its employees  
6 to engage in sport fishing.

7 A There are some exceptions  
8 what I've said. Like for instance, on Cache Creek, the  
9 Arctic char runs into the delta. In that particular  
10 instance, yes, I think this is a grand idea. You know,  
11 I think that those populations as been identified to  
12 me, that they are quite possibly being overfished right  
13 now. I was speaking in general terms. I think that  
14 the sports angling aspect of it, and that you have  
15 to be site specific if you're going to, you know,  
16 if you asked me a question and I looked at it as  
17 a fishery manager, I do think that a lot of times  
18 these problems arise because of just the meeting of  
19 two different cultures of people, you know, wanting  
20 to use the same fish.

21 The problem of overharvest of  
22 fish because you're going to fish it, yes, you know  
23 depending on how many people go into one little hole  
24 to fish, that this has to be I think settled on the  
25 spot by enforcement regulations, you know. Mr. Hunt  
26 here, making sure people abide by their catch possession  
27 limits, that type of thing. I realize that with that  
28 large an area, and the little coverage we have that we  
29 might be able to you know, I might be if favor were  
30 exercised here saying we can do this. But we have to



Peet, Hunt  
Cross-Exam by Carter

1 start somewhere and if people abide by the rules,  
2 I don't see any great problem except there might be  
3 some cultural conflict with sports fishing.  
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Peel &amp; Hunt

Cross-Exam by Carter

Cross-Exam by Hollingworth

1 Q Now, when you dealt  
2 with the impact of the pipeline construction in the  
3 evidence, you quite openly admitted, I take it, the  
4 views you expressed are based on the work of Stein  
5 and others and not on the personal studies that you've  
6 conducted yourself.

7 A No. I might say that  
8 Mr. Stein's division, Resource Impact Division, is a  
9 sister within our organizational division of my own,  
10 and basically what you need is a man -- you know to  
11 start with is a good inventory of what the heck is  
12 there, and that's basically what we did. We see no  
13 reason not to use information by anybody if it's  
14 going to list the species, migration, timing, you know  
15 the general biological aspects of the species. So in  
16 that instance we're quite lucky, we had a lot of good  
17 work<sup>done</sup> for us by other people.

18 MR. CARTER: Those are all the  
19 questions I have.

20  
21 CROSS-EXAMINATION BY MR. HOLLINGWORTH:

22 Q Mr. Peet, you say on  
23 page 5 of your testimony that to date the single  
24 largest commercial activity in the area has been the  
25 Holmes Creek fishery in the Mackenzie Delta. Is that  
26 still the situation?

27 A That's still the situation.  
28 We've been dealing with the Northwest Territorial  
29 Government, they have an economic development group which  
30 is interesting for promoting commercial fisheries for





Peet & Hunt  
CROSS-Exam by Hollingworth

1 the benefit of the people who live in the Territories,  
2 and you know, this is one that they've been particularly  
3 interested in in trying to make go. It's a rather  
4 interesting case history, and I refer to this report  
5 by Barlishen which gives you the history of it, but  
6 basically I think that sometimes what we run into is  
7 what a person as a biologist or as a development  
8 agency working in Yellowknife trying to promote these  
9 type of things run into, is that a commercial develop-  
10 ment is not necessarily what the people who live in  
11 that particular area want. If you read the history,  
12 this particular fishery is fraught, you know, with  
13 these kinds of problems. It's not a fish problem, it's  
14 a problem, well do you want to make it go or not?

15 So yes, it's the only commer-  
16 cial development right there now. It's supposed to be  
17 much larger in scope, but it has what I would refer  
18 to as people problems and it's the size it presently is.

19 I list 75,000 pounds this year  
20 as their quota. They haven't taken close to that yet  
21 at that particular fishery.

22 Q Has their catch been  
23 increasing year by year?

24 A No.

25 Q Has it declined?

26 A Yes, it's been up and down  
27 but the reason is not success from fishing or you know  
28 over-fishing some stock is not there, it's more  
29 associated with the fact that you know, gear problems,  
30 problems to  
31 get people out there in time, interest by the fishermen



1 this type of thing.

2 Q How many people work there  
3 now?

4 A I can't give you that  
5 specifically, I don't know. I would say you're in the  
6 order of maybe two to three fishermen. John, do you  
7 have that particular information?

8 WITNESS HUNT: Yes, I believe  
9 in 1973 there was four fishermen, and their families  
10 worked in the filleting plant, and they were camped at  
11 Holmes Creek at that time. They have since tried to  
12 centralize the operation and expand to make use of the  
13 whole Mackenzie Delta, and so they centralized in Inuvik  
14 and they set up a plant in 1976, which appears to be  
15 the year they will try and make another effort at taking  
16 their quotas in their respective areas in the Mackenzie  
17 Delta.

18 THE COMMISSIONER: You mean  
19 not confine the whole thing to Holmes Creek?

20 A Not confining it to  
21 Holmes Creek, right.

22 WITNESS PEET: The Holmes  
23 Creek is more preferred to where they had their plant  
24 in the site of operations, but they could, you know,  
25 go out far afield from that if they wished, but  
26 basically there was enough fish close in that they  
27 could take it to that point, so why go further, but  
28 you know, they could fish in any of those channels.

29 HOLLINGWORTH:  
30 M R. Q Are you able to  
give a projection on what you consider the future of



Peck & Hunt  
Cross-Exam by Hollingworth

1 that fishery?

2 A The idea, you know,  
3 while you're looking at it and you're talking about  
4 sports and commercial fishery development is, I guess,  
5 bringing in, you know, our culture, the white people's  
6 culture, you know, on how you would use a resource. You  
7 catch the fish, you take it to a market, you sell it.  
8 If that's what the people here want to develop, there's  
9 a potential for it to develop. But basically maybe  
10 that's not what they want, and if that's the case, I  
11 couldn't project whether they're going to have a big  
12 fishery or a small fishery in the Mackenzie Delta.  
13 That's entirely up to the people there, if they want  
14 to do it or not, and to my views, this case history  
15 it would seem to me that right now it's a hit or miss  
16 proposition. I couldn't tell you whether they think  
17 this is a grand idea or not.

18 THE COMMISSIONER: You say  
19 it's not a fisheries question, not an economic question,  
20 it's a question of the aspirations of the people.

21 A Yes sir, it has to be,  
22 you know, the people who are fishing. This is part  
23 of the thesis I tried to develop here, that that  
24 development task force thing, that's what it says, the  
25 people must want it, and the success of it will largely  
26 depend on whether the people want to do that particular  
27 thing.

28 MR. HOLLINGWORTH:  
29 Q And the indications  
30 are that that desire seems to have vacillated, judging  
from the catches in the past.





1 A Well, maybe you're wrong.  
2 I'm making a judgment on people who are fishing out  
3 there and I don't, you know, I know there's fish there  
4 to be caught. The reasons why possibly the commercial  
5 fishery is not operating at a level, you know, where  
6 they're pushing me for more quotas is a question of  
7 those people. I couldn't actually tell you why.

8 Q O.K. Well on page 7, Mr.  
9 Peet, you deal with whether or not to permit sports  
10 fishing to pipeline workers, and you say in the middle  
11 of the third complete paragraph it seems to you that  
12 there is no reason not to permit sports fishing in  
13 those areas where adequate fish stocks are available,  
14 and there would be no conflict with the native people.  
15 Do you foresee your agency or some government agency  
16 providing those figures to the pipeline companies, who  
17 would then be in a position to direct their workers  
18 what or what not to do? Or do you foresee the workers  
19 lining up for a fishing licence and being told, "Well  
20 you can go here and there, but not there." How do you  
21 see that?

22 A That is a particular  
23 problem but I've not largely thought it out in my  
24 own mind as to how we'd handle it. I don't know whether  
25 on that -- I'm not acquainted with the pipeline as  
26 such, you know, how many people will be involved. I don't  
27 know if there's going to be great hordes of guys, you  
28 know, <sup>dashing out</sup> on the tundra with their fishing rods and I  
29 detect that there could be a problem, and I can't tell  
30 you right now. I have no opinion formulated in my own



1 mind how to handle that except for one thing; that  
2 in all cases I think the communities that are, you  
3 know, associated with that particular resource should  
4 have a large say in how the heck they feel about it.  
5 I don't know how this dialogue will take place or  
6 any mechanism, I just feel that to avoid any conflict,  
7 you know, there that, you know, we'd better come up  
8 with some kind of a thing where people can talk to  
9 one another to iron out the situation. Given that the  
10 local people, you know, you know they make representa-  
11 tion for this as an important food source for them  
12 in a domestic sense, that they should get prior --  
13 that we should recognize this and as I said, close off  
14 areas entirely for domestic fishing, if needed.

15 Q Well, that last point  
16 certainly seems reasonable. At the present time do  
17 you receive representations from the native groups  
18 or communities as to what areas should or should not  
19 be opened to any other fishermen?

20 A Now, it is at a very low  
21 level now. The problem occurs now and then between --  
22 I'll give you an example, in Siviston Lake we got a  
23 request for a quota, I forget which settlement, we'll  
24 say for instance Fort Good Hope maybe, the name of  
25 the lake sticks in my mind but I can't remember its  
26 associated community, and basically then some other  
27 people from another community said, "Well, that's  
28 our lake, you know and we don't want them to commer-  
29 cially fish in there."

30 So what we did was, you know,



Peet & Hunt  
Cross-Exam by Hollingworth

1 we had correspondence back and forth and we asked --  
2 we tried to get it settled, you know, whether they  
3 wanted it strictly for domestic fishing or could there  
4 be some commercial fishing there, and as it turned out,  
5 you know, it was settled on a local level.

6 That's about the level of the  
7 type of thing we're into right now. All right, so the  
8 dialogue, the background chatter is quite low. We  
9 get requests in, very small ones usually, we look at  
10 them, we go back for more information and we try  
11 to satisfy what the people want. But there's no formal  
12 mechanism set up, which you know, as the problem  
13 increases there better be. We have nothing formal setup  
14 right now.

15 I'm very aware by the way, there's  
16 a comment in the front of Gemini North, is  
17 maybe a little parable. These gentlemen were over  
18 on the Crow Flats, you know, this sticks in my mind, but  
19 basically there was one native person there and they  
20 were telling him how they didn't want that pipeline  
21 to go there because they were worried about their area,  
22 their environment, and the way it was. Then that  
23 evening there was another native gentleman came along  
24 and beseiged him to come past with that thing and hire  
25 his son, you know, to work on it. This is what we're  
26 into, you know, when we say what the people want. I for  
27 one sometimes get caught, I don't know who the people  
28 are. I would suggest that we've got to try to arrive  
29 at some kind of consensus, when a person like me  
30 is asked to manage a fishery and, you know, I'm to do





Peet & Hunt  
Cross-Exam by Hollingworth

1 the right to specifically say, you know, you can or  
2 cannot do anything and that's our fishery officer  
3 right here. Go under the Act, and enforce the legisla-  
4 tion I'm talking about. If you get into a private  
5 thing where your company wishes to tell people what  
6 or what not to do, you know, as a conservation measure,  
7 great; but you can't -- you know, we can't back you  
8 up in that and say, "Well, yeah, we're going to abide  
9 by that too." Because we have to, you know, the  
10 idea of fishing licences is <sup>to</sup> advise a member, you know,  
11 if there's no reason why he can't have a licence and  
12 he's a Canadian citizen, well he gets his licence. We  
13 can't say, "You can't have it because your company  
14 said you can't."

15  
16 Another gentlemen will walk  
17 up and say, "Well, I don't work for any company. I want  
18 a fishing licence." So you know, we have to abide by  
19 only our strictures in that sense.

20 Q So you foresee the situation  
21 where your agency would increase manpower to look after  
22 the situation, it would not be up to the pipeline  
23 company.  
24  
25  
26  
27  
28  
29  
30



Peet, Hunt  
Cross-Exam by Bayly

1 A No, I didn't say that.  
2 We would have to look after the regulation, you know,  
3 the way they're written. If any companies want to  
4 impose their own conservation methods, we'd welcome  
5 them. All right, it's just that the enforcement of  
6 those particular things would be up to you and not up  
7 to us.

MR. HOLLINGWORTH:

8 Q O.K., thanks very much.

9 CROSS-EXAMINATION BY MR. BAYLY:

10 Q Mr. Peet, at page two  
11 of you evidence, you state that:

12 "Preservation of the option to fish is the first  
13 priority on fisheries management".

14 Would you agree with <sup>me</sup> that the preservation of the option  
15 to fish domestically, presupposes the maintenance of  
16 fish populations?

17 A Yes, there's a dichotomy  
18 here, as a biologist you know -- that is really an  
19 answer to the problem of people telling somebody in  
20 their own particular area what to do with their resource.  
21 But as a biologist, I would be rather concerned that --  
22 I don't care if somebody domestically fishes or  
23 commercially fishes or sports fishes. If he goes over  
24 what nature's bounty is, he's going to be in a problem  
25 with that population.

26 Given that, I'm sure that  
27 there's some domestic areas that might be overfished.  
28 However, I have no authority or -- you know, I can't  
29 control that. O.K., so that thing there, is that the  
30 management <sup>of</sup> it in a domestic sense is up to the



Peel, Hunt  
Cross-Exam by Bayly

1 people in the area.

2 Q So in order to protect  
3 any of the fisheries and I suppose particularly the  
4 domestic fishery, you have to protect the resource  
5 from exploitation by any means, whether it's fishing  
6 or any means that may harm the fishery inadvertently.

7 A Are you sir asking me  
8 to make a comment on that, you know, we've got to  
9 look after the domestic thing? Are you asking me  
10 a question?

11 Q Yes.

12 A My comment -- I'll use  
13 an analogy, I rather think of myself sometimes as being  
14 an auditor that can control two accounts but can't  
15 control the third. So basically, when I look upon the  
16 fish resources being a deposit of some description, I  
17 can control the number of fish that come out of it  
18 from two accounts; say sports and commercial. The  
19 domestic, I have to abide by the fact that the people,  
20 you know, in that area are going to look after their  
21 resource.

22 If I'm asked to let fish out  
23 of the other two accounts, I have to try to determine  
24 that the domestic part of it is O.K. and that the  
25 other two accounts won't take away from that, you know,  
26 that use.

27 Q Right. Do you rank them  
28 in priority? Do you think of the domestic fishery as  
29 perhaps being in the Mackenzie; the most important of  
30 three?





Deet, Hunt  
Cross-Exam by Bayly

1 A I have to.

2 Q Yes.

3 THE COMMISSIONER: That's  
4 the policy.

5 A Yes.

6 MR. BAYLY: Right.

7 A Well, I also as an  
8 individual, you know, people who are taking in that  
9 area for their own -- I don't think it's undeniable that  
10 that's the main food resource for those people and that  
11 given that that would be -- as a human being, be my  
12 first concern that, you know, nothing would happen to  
13 the food for those people.

14 Q All right. An example  
15 of this, as I understand is that when there was a  
16 proposal by Dome Petroleum to dredge the Tuktoyaktuk  
17 Harbor, that the Fisheries and Marine Service were  
18 asked to assess the proposal because there was a domestic  
19 fishery in that harbor?

20 A Yes, we do get in a little  
21 trouble. I've been discussing this, before I gave my  
22 evidence with our district manager and that. Maybe  
23 it's with the historical way that regulations come  
24 about, but it's a funny thing, but we seem to be better  
25 at regulating what people do in an exploitative sense  
26 with the fish. Like you want to catch them with a net,  
27 a rod, that type of thing. But when it comes -- I guess  
28 this is what's developing now. When it comes to other --  
29 you know people harming the fish because they're doing  
30 something else, not necessarily to the fish, our



Peel, Hunt  
Cross-Exam by Bayly

1 legislation in some instances can be, you know -- it  
2 seems to me that we can be very weak on that -- what  
3 we can and cannot do.

4 Q So if there's a deficiency  
5 in your authority, it's as activities of man that are  
6 not related to fishing may hurt the fish resource?

7 A Yes. I think that Section  
8 33 that's been developed is an answer to this, you know;  
9 deleterious substances and this type of thing, but we  
10 can get into -- you know, we'd be relatively powerless  
11 in some instances in my opinion because something else  
12 like a guy drives a bulldozer over a bunch of nets in  
13 a river.

14 I think that that might have  
15 to be settled largely by a criminal claim or something  
16 you know, because it was damage of private property.  
17 But if the guy drove it over three fish, then we could  
18 probably say something.

19 Q Right.

20  
21 Even Section 33, as I  
22 understand, involves more the problem of things being  
23 put into the water as opposed to doing things to  
24 spawning beds mechanically that might make them un-  
25 acceptable to the fish.

26 A In my opinion, yes.

27 Q Yes. So, there may be  
28 things that you think are priorities but which are  
29 beyond the control of the legislation that you're in-  
30 volved in the enforcement of, as far as protecting the



Peet, Hunt  
Cross-Exam by Bayly

1 domestic fish resources are concerned?

2 A I think what is is that  
3 are some things could happen that right now we mightn't  
4 have regulations to cover but I think that under the  
5 present things we got that we could certainly come  
6 up with, you know, regulations, if needed, to meet those  
7 things.

8 There's still things can happen  
9 here, you know. We could make a bunch of regulations  
10 figuring that some things might happen and end up  
11 something pretty unwieldy, you know, just to process  
12 regulations or we could wait and meet them as they come.  
13 You know, there's payoff on both sides I guess.

14 Q Well, what would you  
15 suggest Mr. Peet? Would you like to see those regula-  
16 tions prepared in advance of a project, or would you  
17 like to adopt the wait and see?

18 A Right now, I have two  
19 sides and the one says "why make regulations that --"  
20 there is an athema in the public to regulations that  
21 government people put on them; are you going to order  
22 their lives? There's also the thing from my point  
23 of view of the resource that, you know, if you can  
24 meet something before it happens, you might be  
25 able to handle it. So, I don't know, you know, I guess  
26 I'd have to look at each situation and make a personal  
27 judgement on it.

28 Q All right. Would you like  
29 to see regulations that were perhaps general enough  
30 to leave that to the discretion of a man like Mr. Hunt?





Peet, Hunt  
Cross-Exam by Bayly

1                                   A     I think that -- well,  
2     I think personally that the regulations are general  
3     enough now that we can handle those things and I've  
4     got great respect for Mr. Hunt, as I'm sure he has for  
5     me, but I'd like for both of us to have a say.

6                   (LAUGHTER)

7                                   Q     Now, do you think it  
8     would be possible for you or your service to devise  
9     a scheme, supposing that you could start for example  
10    this summer to assess whether or not the Mackenzie  
11    Valley Pipeline is likely to have effects on   fish  
12    populations or local catches; sort of a prepipeline  
13    monitoring?

14                                  A     Well, I would suggest  
15    that the other work that's been done so far that,  
16    you know, I sat here for the last few days and listened  
17    to when these gentlemen<sup>from</sup> Slaney and that, that's  
18    exactly what that's pointed toward and the judgement  
19    on that has to be made on those particular things. If  
20    you ask me, like to go in there with my division in  
21    essence, I'm just going to jump and probably repaint  
22    and do a lot of things that have been done before. I  
23    would think that with the level of things that are done  
24    right now, these are -- there's some decisions to be  
25    made.

26                                  There's holes, you know, where  
27    they have to go back, but I wouldn't add anything except  
28    more duplication, probably with some of this. In the  
29    instance that specific areas are pinpointed, I think  
30    then that whoever is identified with this -- you know,



Peet, Hunt  
Cross-Exam by Bayly

1 that's where they'd go and do it.

2 Q Have you in any review  
3 of what these people have been doing for the various  
4 consultants either for government or industry, identi-  
5 fied either problem areas or weak research areas that  
6 you'd like to see more work done upon?

7 A I, you know, I have a  
8 listing of them and one of the ones I used was --  
9 well, the ones that are listed in the reports I  
10 alluded to by Jessop and Stein and there's a bunch of  
11 critical areas named by Bissett in his report and  
12 right now, if I was asked, you know, where would I  
13 start, I'd go look there.

14 One thing that I'm sort of  
15 on the threshold looking down the Mackenzie River,  
16 or whatever from the Great Slave, well we have been,  
17 you know, my division has been specifically involved  
18 and as yet we've got no trigger that would say "hey,  
19 you people get in and get involved"; they were still  
20 -- we're trying to have ourselves girded for whatever  
21 eventuality might arise. But we have not been told  
22 specifically, you know, for us to get in there and get  
23 involved with this.

24 Q Well, we've been --

25 A By the way, there's  
26 other places in the Arctic too that you know, we're  
27 into and that's what the problem is; priorities.

28 Q Do you feel you spread  
29 too thin then, to do some of this work?

30 A I went through a blood



Pect, Hunt  
Cross-Exam by Bayly

1 letting ceremony called a budget before I came up  
2 here and I would say that I'm spread extremely thing,  
3 yes.

4 Q Yes. Now, we've heard  
5 from Mr. Stein who you've referred to and Dr. McCart,  
6 that in the Mackenzie, for example, the areas in which  
7 certain species of fish spawn and overwinter are just  
8 largely unknown. In order to determine whether pipeline  
9 construction, operation and <sup>maintenance</sup> is affecting  
10 fish, would <sup>you</sup> feel that those are things, that in an  
11 ideal world anyway, should be known?

12 A Yes, most definitely so.  
13 Again, that type of information -- what you're talking  
14 about, you know, the possible impact of something on  
15 the resource would be identified by -- I think by  
16 Mr. Stein's group rather than my own. Where we get  
17 into it is, if people are using them from an exploitive  
18 sense, then, you know, it would become my, you know --  
19 I have a responsibility in there.

20 It might be, you know, extremely  
21 artificial. What it is, is you've got groups of  
22 people that got budgets that are, you know, you make  
23 your priorities and it just so happens that my particu-  
24 lar direction given to me by the people who tell me  
25 what to do, is right now not identified that way.

26 Q O.K. well, the concern  
27 that I have is that if we don't know some of these  
28 things beforehand and you're put in the position of  
29 say, having to put on new regulations on the size of  
30 catches or areas of where commercial fishing or even





~~Reed~~, Hunt,  
Cross-Exam by Bayly

1 domestic fishing could be carried out, then somebody  
2 will have to determine whether there's been an  
3 effect of construction or anything else?



Peet, Hunt  
Cross-Exam by Bayly

1                   A     I've an idea we like to  
2     have the base information when we manage something  
3     before it starts. In a lot of instances, we have  
4     to do it while the darn thing goes ahead with it.  
5     Sometimes when they're small, you know, you feel you  
6     know a judgment call eh, that you can handle it, okay.  
7     In other instances where you know they might want to  
8     take 2 million pounds out of some place, well then  
9     my nervous quotient gets very high, and you know that's  
10    when we would put resources in and probably say we  
11    can't do anything<sup>with this</sup> before, you know, put a time on it.

12                   This again is sort of site  
13    specific, you know as the occasion arises. People like  
14    myself often get accused of firefighting, and it's  
15    not because we want to , but that's the way the system  
16    works.

17                   Q     And I gather from that  
18    that you anticipate, that you may have to do some  
19    fire fighting, if there's a problem with either of  
20    these projects if it goes ahead on schedule?

21                   A     Quite possibly so.

22                   Q     I guess the difficulty  
23    you will have then is to assess afterwards whether  
24    there has been effect on the domestic or commercial  
25    fishery can be attributed to any problems with the  
26    development of one of these projects?

27                   A     No I would rather think  
28    you're giving me two questions. When there comes  
29    a question of domestic fishery suffering because you  
30    know I've let a commercial thing cut in there, or you



Peet, Hunt  
Cross Exam by Bayly

1 know there's a sport fishery might be taking too many,  
2 and then a domestic fisherman might be suffering. That's  
3 one question; but the possible effects of you know,  
4 what some catastrophe or something like that might do  
5 on fish populations, is what all this information you've  
6 already been presented is all about. I wouldn't  
7 say it's any way complete, but you know you can see  
8 there's four years of work there, done on this stuff eh?

9 You know, that's what that's  
10 for. I couldn't do it in another four years.

11 Q Well, it wouldn't  
12 necessarily be a catastrophe one can see, as I  
13 understand. You might have the siltation of an  
14 important spawning bed, that might not even be detected  
15 until you suddenly realized that where people had been  
16 fishing domestically, they were no longer catching the  
17 fish that they had caught earlier.

18 A Well, we certainly would  
19 know, hopefully that siltation occurred, that it  
20 already happened would be that <sup>it</sup> would be told eh, you  
21 know, we're not getting any fish down here. I would  
22 submit that once you've given me fait accompli, I  
23 can't stop that, you know, that's happened.

24 Q Now, assuming that you  
25 could get a suitable quality information prior to  
26 the beginning of construction, would you be looking  
27 for catch per unit effort figures, to provide some  
28 data that would be useful to you in being able to  
29 monitor whether there'd been any effect on domestic  
30 fisheries?





Peet, Hunt  
Cross-Exam by Bayly

A

1 Yes, there's certain tools  
2 we use to measure certain events, eh? If you got  
3 a commercial fishery in the area, and it was identified  
4 that there's going to be something happen here  
5 concurrent with it, I think what I'd like to know is,  
6 I'd like to be able to describe that fishery in my  
7 terms, you know, over a couple of years, with you know,  
8 what the catch is like. And then if something happens  
9 with that catch, I would have a comparison to say that  
10 you know possibly there's something happened here  
11 because this thing is working alongside of it.

12 I could describe the action  
13 taking place, you know, like maybe the abundance of  
14 fish drops off, there's species different composition,  
15 you know and there's some thing that might just be  
16 attributable to an activity, a construction thing,  
17 it might just be attributable to the fact that there  
18 might be overfished. You know we have to be carefull  
19 or I would think that that's where my judgment will  
20 come in. You know, is it because you're fishing them,  
21 or is it because you've built something there that's  
22 been affecting the fish. I need some comparative --

23 Q You need some before and  
24 after work because of statistics.

25 A It's the same way with  
26 Dr. Sprague; you know these things.

27 Q Well, my concern is that  
28 the way this problem may show up, whether it's from  
29 overfishing, or some damage that has been done, is  
30 that instead of taking a week to catch the winter's



1 supply of fish, a family may take three weeks. They  
2 may get the same number of fish, so the catch won't  
3 go down --

4 Okay, I don't think that my  
5 particular part of the biological science is that  
6 precise that I could help much with that kind of  
7 a thing. You know, it's a -- I don't think we could  
8 get down to that degree, that what you're asking me  
9 is okay, this happened, could I tell you that that's  
10 the reason why, or maybe I could come up with  
11 something that wouldn't happen eh? All I could pose  
12 is very broad boundaries, you know, in the management  
13 sense, that to look after that population, but there's  
14 variations within it, that I, you know, I couldn't  
15 measure.

16 Q But all I'm suggesting  
17 to you is if you're trying to manage and protect  
18 a resource for the purpose of perpetuating the fishery,  
19 you've got to know sometimes not only how big the  
20 catch is, but how long it took to get in comparison  
21 with other times.

22 A Oh yes, well we -- if  
23 you're on this topic of catch premium of effort, that's  
24 quite right, you know, we would endeavor to get that  
25 kind of information. I would say that again we're  
26 into a problem, eh, domestic fisheries, because of  
27 their very nature, are about the most difficult type  
28 of exploitation that a person like me could try to  
29 measure, for some reasons I outlined in my evidence.

30 Q And I understand that one



Peet, Hunt  
Cross-Exam by Bayly

1 of these reasons may be the reluctance of domestic  
2 fishermen and their families to talk about either  
3 the size of their catch or the length of time that  
4 it has taken them to procur it.

5 A That's correct. I thought  
6 about this, you know, before I put it in evidence and  
7 stuff like that, and I'm quite aware of the feelings  
8 of lots of people to do with you know government  
9 regulations and that type of thing. I would draw  
10 an analogy that you know, when the DB -- or Dominion  
11 Bureau of Statistics, I guess they're called, come  
12 around with their list and they want to know certain  
13 things about my life, I rather don't like some of those  
14 questions, and they tell me by law I have to answer  
15 them. I would say my reaction as where I live and  
16 my background, it can be analagous to their reaction  
17 when a man comes in and says well, what did you catch  
18 and where is it, you know, this type of thing, so  
19 that's what you're dealing with, it's a people problem.

20 Q Now, have you considered  
21 in your service, if you wanted to collect this  
22 information perhaps requesting some of the people's  
23 organizations, whether they are hunters and trappers  
24 associations, fishermen's associations, hamlet councils,  
25 native groups, to assist you in trying to collect this,  
26 because it seems to me it may be important data to have

27 A We would endeavor to  
28 you know, we do try to create a lot of good will.  
29 Sometimes we're suspect and sometimes we get, you know,  
30 castigated so to speak, but you know, we go after that





Peet, Hunt  
Cross-Exam by Bayly

1 type of thing, but I think there's one thing I should  
2 say is that catch premium effort statistics is a rather  
3 delicate statistic that I use to make statements about  
4 fish populations, and in essence it should be collected  
5 by people who know what they're doing. In other words,  
6 it's not something that -- well, but it this way. Maybe  
7 a hunter would ask me to go out and help him hunt, and  
8 I'd probably make a mish-mash out of it. By the same  
9 token, that gentleman might make a mish-mash out of --  
10 you know, I wouldn't know if I could trust the stuff  
11 that he got, not that he wouldn't do it honestly, it's  
12 just that he's not trained to look at it that way.  
13 It's a delicate statistic, in my opinion.

14 Q That means though that  
15 if he were trained, perhaps, he could assist in collecting  
16 this kind of data.

17 A I'll put it to you this  
18 way. I've assumed that I'm fairly well trained in  
19 this, and sometimes I wonder, when I had to do this,  
20 whether I'm doing it right, you know. The situation  
21 is that it's -- you had to be -- just let's say it's  
22 a very delicate statistic, if it's going to mean  
23 anything. There's lots of people who take it and  
24 you know they -- you put a net in a lake for a night  
25 and catch so many fish, and you make some kind of  
26 an extrapolation of three months and you figure out  
27 the fish population there. I would submit that that's  
28 not very good information.

29 Q Well, difficult or not  
30 though, you'd agree with me that it would be very



Peet, Hunt  
CROSS-Exam by Bayly

1 important if that information could be obtained.

2 A In specific areas, you  
3 know. If you identified to me that we have a problem  
4 here and we have to go in, I wouldn't use that as  
5 one thing, I don't particularly know why you're  
6 trying catch per unit effort statistics, there's  
7 other things that are available to measure it.

8 Q I'm not suggesting it's  
9 the only yardstick, but it does appear to be one that  
10 that's very difficult.

11 A It's one that we would  
12 use in a repertoire of other things.

13 Q But you wouldn't close  
14 the door to some method of getting local cooperation  
15 to help you gather this and other kinds of statistics?

16 A No sir, we would welcome  
17 people. I would like to say that, you know, if it's  
18 going to mean something, see, what happens if you  
19 go into that kind of a thing, you know you get all  
20 sorts of good will with the information that's provided  
21 but <sup>if</sup> you can't do anything with it, they get brownd  
22 off because they don't think you, you know, what are  
23 we doing here. At the same time one sort of hand  
24 struck because they can't make any statements on it.  
25 So if we're going to do that, which we do, I'd like  
26 to be very careful how it's promoted.

27 Q There are a couple  
28 of terms that perhaps you could define for us, and  
29 they're found on page 1. The first is variation orders.

30 A Yes. If you look in the



1 Northwest Territories fisheries regulation, section  
2 37 is entitled "Variation Order", it says,

3 "The Regional Director", and it should be Director-  
4 General now I think, "may by order vary any  
5 closed-season or fishing quota fixed by these  
6 regulations."

7 And it's exactly what it says, it's an order that's  
8 in variance with what's promoted in the schedule  
9 in the back, and what this allows us to do is it allows  
10 us to manipulate what these things say to the benefit  
11 of, you know, what people want in a particular area.  
12 It just gives you a manipulation of your regulations.

13 Q So from time to time  
14 on the advice of your local officer, this sort of  
15 thing, sort of variation from the normal regulations,  
16 could be made to react to certain pressures on fish  
17 populations?

18 A Well, not really pressures  
19 as much as requests. You know, if you want a quota,  
20 you write in for it, we look up our list to see if  
21 it's on the schedule, and if it is, we issue a variation  
22 order that says it's open for a certain period of  
23 time, and there's one other thing that happens. If  
24 it's not on the schedule, we then have to apply for  
25 an amendment to this particular schedule, which  
26 takes a bit of time, and then, you know, would  
27 be on there and then we could vary it by variation  
28 order. It's a vehicle to achieve fishing, commercial  
29 fishing.

30 Q Now again on page 1 of,





1       sorry, yes, page 1 under the last paragraph under  
2       item 1, you talk about harvestable stock. Does that  
3       refer to size of fish, or --



Peet & Hunt  
Cross-Exam by Bayly

1                                   A     I guess I'm guilty of  
2     a colloquialism there. Will you tell me where that  
3     is again?

4                                   Q     It says in the last  
5     sentence of point 1:

6                   "Only the harvestable stock over and above  
7                   those needs should be used for commercial or  
8                   sports developments."

9                                   A     Yes, that means, you know  
10   could  
11     the estimate of how many fish you remove from the  
12     population for that particular purpose over and above  
13     what they need domestically, over and above what is  
14     really needed biologically for that stock to remain  
15     renewable.

16                                  Q     All right.

17                                  A     To maintain itself.  
18     That again, you know, that's what we say, but my job  
19     is to try and measure that. Sometimes I'm very good  
20     at it, sometimes I'm not so good at it. You know,  
21     that's what I'm all about, to try to measure these things.

22                                  Q     In point 2 in that  
23     paragraph you talk about;

24                   "Fisheries development should be for the benefit  
25                   of the long-term residents of the north."

26     Do you mean long-term in a general sense, or do you --

27                                  A     I quoted that out of  
28     that task force thing. I myself am at a loss -- I  
29     couldn't define what "long term" meant. In our  
30     regulations it says that if a gentleman is a resident  
   in the Territories for six months, you know, he's a



Peel & Hunt  
Cross-Exam by Bayly

1 resident or he can get a licence for various things.  
2 I know what that was toward, you know, when we sat  
3 down and discussed that, but I think what they're  
4 guilty of there is an undefinable term, it sounds good  
5 but you know, who are you going to exclude and who not?  
6 I wouldn't want to judge that one.

7 MR. RYDER: You could include  
8 Mr. Marshall and exclude Mr. Hollingworth.

9 THE COMMISSIONER: Well, that's --

10 MR. BAYLY: Q On page 2 under  
11 this item 3(c) you speak of taking into account the  
12 wishes of long-term residents in deciding whether  
13 sports or commercial fishery goes ahead, and leaving out  
14 the term "long term" how does one go about this in  
15 determining the wishes of the people? Are we into the  
16 same problem we discussed earlier, or --

17 A I can give you an example  
18 all right. Over in the Keewatin coast there's a cannery  
19 at Rankin Inlet and there is a government-sponsored  
20 fishery there to get fish to make that operation go.  
21 It's supposed to be for the people there. There's a lot  
22 of good people attached that want to make it go that  
23 way. There is discussions as to whether really that's  
24 what the people want. In particular Whale Cove resi-  
25 dents who rely in that area on that commercial fishery  
26 requested a commercial fishery from under our auspices,  
27 and the stipulation was that this was not to be for  
28 the cannery, this is for us.

29 Now O.K., we said, "All right,  
30 you've got a quota and you people can catch it."





Peet & Hunt  
Cross-Exam by Bayly

1 I haven't yet got into the  
2 problem of having to designate various areas within  
3 the Territories pertinent to various communities. We  
4 try to stay out of that because, you know, it leaves  
5 the situation more open. In my own opinion if this  
6 type of development takes place a little later on we  
7 might get into a situation of having to ask, you know,  
8 and this would be by dialogue with the people in the  
9 areas, maybe we should define their areas and this  
10 should be posted in the backup regulations so that  
11 we know what we're dealing with when we ask them  
12 "What do you want to do with your resource?"

13 An analogy again would be  
14 -- I'm great on analogies somehow. -- would be my home  
15 in Newfoundland. That's the way they do it. They  
16 partition the coast into various areas for salmon fisher-  
17 men, and you know, licences<sup>let</sup> only in that area, so many  
18 licences per area and you know, they do it by (inaudible)  
19 or whatever they get the various (inaudible) in there.  
20 That, I think, is the answer to the fact that there's  
21 so many people to use a resource they couldn't make  
22 up their mind what they wanted to do, and that -- O.K.,  
23 that's not so in the Territories yet but it might well  
24 develop, and that's a reaction by people like me that  
25 handle that situation.

26 Q O.K., I understand then  
27 that the problem just may arise from the pressure of  
28 on the resource from whatever source, but in particular  
29 if people are competing for the same areas from  
30 different places.



Peet & Hunt  
Cross-Exam by Bayly

1                   A     O.K., the first thing we're  
2 interested in is you know in that particular thing I  
3 refer to the fact that you know we're sort of bound,  
4 you know, if there's requests coming from anywhere to  
5 have commercial or sports fishery, that we have to go  
6 back to the settlement that we would think is associated  
7 with that particular thing and ask them what do they  
8 want, and<sup>that</sup>/is the problem I alluded to before, I get  
9 into that, who are the people, who do I listen to?  
10 What it is, I guess, is a question of judgment. I have  
11 to speak to Officer Hunt who is in Inuvik, the N.W.T.  
12 Government especially because I like to think that they  
13 are the governm~~at~~ of the people here and I should  
14 listen to them, and we go to the councils and try to,  
15 you know, decipher this, get it worked out.

16                   If the problem becomes acute  
17 we got to, you know, sort of make a mechanism, you know,  
18 to get this thing ironed out. Right now it's at an  
19 insipient level, it's there but it's not that great  
20 a problem. We can handle it.

21                   Q     O.K. now, how does the  
22 Fishery Service at present differentiate between  
23 domestic and commercial fisheries? I notice, for  
24 example, that you mention that local fishermen who  
25 sell their catch in excess of their needs, they may be  
26 domestic or commercial fishermen.

27                   A     This is -- some of us  
28 are guilty of some unmeasurables, like everybody else,  
29 and what was in the old days, you know, if you caught  
30 fish in excess of what you wanted you could sell it to



Peet & Hunt  
Cross-Exam by Bayly

1 somebody, and what happened there was that then, you  
2 know, you could get kind of a commercial fishery  
3 developing, some people would want it and some people  
4 wouldn't, you know, and no one would have any control  
5 over it whatever. O.K., we were asked to arbitrate  
6 in this case. What we did is we said, "If you sell it  
7 it's a commercial fishery, cut and dried."

8 O.K., that leaves us a problem  
9 of you know, O.K., we would make the assumption then  
10 if you're going to sell fish we <sup>could</sup> know about it and we  
11 can control it. I'm quite sure that in some areas  
12 there's lots of fish though that we necessarily don't  
13 know about. It depends on how great a problem this  
14 would be, you know, before we get involved in it.  
15 How do we differentiate between a commercial and a  
16 domestic fishery? You have to refer to the sections in  
17 the legislation that define it for us. The under-  
18 cover stuff that might occur, you know, we're not  
19 aware of it. It sort of goes back to the fact that  
20 these people, we submit, to the fact that they want  
21 to do -- they want to handle their own resource.  
22 If that's a fact, well I should submit the thing that  
23 if it's a great problem they'll come and tell me and  
24 ask me as an arbitrator to do something about it.

25 That's pretty ideal, but you  
26 know that's sort of the way it works.

27 Q Now, you mention on page  
28 3 that there are problems with monitoring domestic  
29 fisheries, and I wonder if you've found any particular  
30 area in the Northwest Territories where you feel you





Peot & Hunt  
Cross-Exam by Bayly

1 really have this in hand?

2 A Yeah, not really. I was  
3 going to say the angling that some of my own people in  
4 my own camp <sup>might do,</sup> I know what they do. I'm not sure  
5 when I think of that, but all over the Territories  
6 there's you know, this thing about a domestic fishery,  
7 and I guess it's promoted by this feeling of woutherners  
8 telling northerners what to do type of thing. I'm  
9 willing to admit that, and it's a problem that  
10 exists now. It is also the fact that, you know, anybody  
11 who fishes, no good fisherman tells another guy where  
12 he catches his fish. So it's there.

13 Q It's part of the  
14 mystique.

15 A Well, yeah, it's a problem  
16 that you'd have with any kind of a domestic operation.

17 Q -Now you refer to domestic  
18 fisheries again on page 3 as being located at stream  
19 mouths, and I invite you to comment on this, but it  
20 seems that conflicts may arise at these areas with  
21 wharfsites and other facilities that may be located  
22 by the various applicants for this.

23 A I agree, and again my  
24 opinion on this subject is if somebody wants to build  
25 something, and it's been identified as an important  
26 domestic fishery to a particular community, that the  
27 people in that community should be consulted and  
28 maybe have the last say as to whether that particular  
29 thing should go there or not, in my opinion, and I  
30 can say no more than that about it. I just feel that



Peel & Hunt  
Cross-Exam by Bayly

1 if there are so many fish in there and it could inter-  
2 fere, then it's up to the people who fish there to have  
3 a large say in that particular thing.

4 THE COMMISSIONER: Well, you're  
5 saying that they should have a veto then.

6 A Sir, I don't know  
7 whether I could go that -- I don't really think that  
8 I'm qualified to make that statement. It would be a  
9 very personal opinion. I don't really know.

10 THE COMMISSIONER:

Well, I think there's  
11 a limit to the extent to which these discussions are  
12 helpful to the Inquiry; I think Mr. Peet has gone as  
13 far as he can. Fundamentally it comes down to this.  
14 If there's a conflict between the domestic fishery and  
15 -- at the mouth of a river, and if either Arctic Gas  
16 or Foothills wants to build a wharf there, there's  
17 a point that COPE sought to make in its argument in  
18 support of introducing the evidence I ruled upon this  
19 morning, unless you give the people a veto, the argument  
20 that COPE has advanced is that the wharf is always going  
21 to go in there and/or unless the attitude of the  
22 pipeline company is that they will treat the objection  
23 to those people in the same way as they would the  
24 objections of people living in Shaughnessy Heights in  
25 Vancouver who object to a boiler factory going <sup>in</sup> across  
26 the street. That's the kind of problem we're faced  
27 with, as I understand it, and I really don't think that  
28 there's much to be gained by getting all the people who  
29 come before us to reflect upon it, because it's a  
30 problem whose dimensions are plain enough to me, and I



Peet & Hunt

Cross-Exam by Bayly

1 think to others at this stage.

2 MR. BAYLY: I understand,  
3 sir, and the area in which I'd like Mr. Peet to comment  
4 on isn't to do with the fishermen so much as his service, and  
5 I wonder if the Fisheries Service has with regard to  
6 things like wharfsites attempted to define some sort  
7 of guidelines or limits as to where these should be  
8 placed in terms of distance from --

9 A I can only refer back to  
10 the evidence, these questions were addressed to Mr.  
11 Stein and Mr. Niven, and I know that they had trouble  
12 with it and I make a statement that they were much more  
13 qualified about that than me. You know, I could talk  
14 personally about it but I don't think that has any  
15 relevance.

16 Q I understand that Mr.  
17 Hunt and you have been trying to deal with the problem  
18 of a proposed Hovercraft docking area in your  
19 domestic fishing area at present. Are you aware of  
20 that one?

21 A Well, if I was dealing  
22 with it I didn't know about it.

23 WITNESS HUNT: I can talk about  
24 that.

25 Q Yes, Mr. Hunt?

26 A It was D.P.W. and it has  
27 to do with the highway, and they're looking for an  
28 approach to the river, at Arctic Red River, and it just  
29 so happens that the approach that they proposed initia-  
30 lly was right in line with the domestic fishery at the





Peet & Hunt

Cross-Exam by Bayly

1 mouth of the Arctic Red River and so D.P.W. went in  
2 and talked to the people and they disagreed with the  
3 approach/<sup>being made</sup> there and the problem was that it was going  
4 to cost money to build extra roads to make the approach  
5 some place else, and so right now it's a standoff, I  
6 don't really know what the latest developments have  
7 been, but there is an incident which is similar to what  
8 you're speaking of.

9 (WHERE TO NOW? FISHERIES DEVELOPMENT IN N.W.T.  
10 MARKED EXHIBIT 522)

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Peet, Hunt  
Cross-Exam by Bayly

1 MR. BAYLY: Mr. Commissioner,  
2 I have perhaps twenty minutes more and it appears to  
3 be twenty to four, approximately. Would this be an  
4 appropriate time for coffee?

5 THE COMMISSIONER: Yes,  
6 certainly.

7 (PROCEEDINGS ADJOURNED FOR A FEW MINUTES)

8 (PROCEEDINGS RESUMED PURSUANT TO ADJOURNMENT)

9 THE COMMISSIONER: Well, we  
10 will carry on again. Mr. Peet and Mr. Hunt, during  
11 the tea break, Mr. Hatfield said to me that we always  
12 seem to get to his speciality, fish, on Friday after-  
13 noon; whenever he was tired.

14 MR. BAYLY: It may have some-  
15 thing to do with the church sir.

16 THE COMMISSIONER: I can assure  
17 you we're all benefiting greatly from what both of  
18 you have said and paying the closest of attention  
19 except that this seems to be the warmest room I've  
20 encountered in the Northwest Territories in the last  
21 year and -- so, we'll just struggle on for a little  
22 while longer.

23 I presume you gentlemen would  
24 rather finish this afternoon than have to come back  
25 again, so.

26 MR. BAYLY: I'm almost through  
27 sir and the struggle won't be much longer.

28 Q Mr. Peet, you've discussed  
29 the sports fishery. In your opinion with the regula-  
30 tion that you have pointed me to -- I'm sorry, Section



Peet, Hunt  
Cross-Exam by Bayly

1 37, I believe it is. Could some areas be closed for  
2 sports fishing and others left open, depending on  
3 the wishes of local people, assuming that they could  
4 be assessed?

5 WITNESS PEET: Yes, there's  
6 a precedent for that in the N.W.T. Regulations right  
7 now. If you look in there, there's a reference to  
8 Lac La ~~Marte~~ and basically what that says --

9 THE COMMISSIONER: A reference  
10 to what?

11 A Lac La Marte.

12 THE COMMISSIONER: Oh yes,  
13 right.

14 A What that says is that  
15 there can be commercial fishing in Lac La Marte and it  
16 is to be only done by a resident of Lac La Marte. I'm  
17 not sure if "resident" is defined or not. But, basically  
18 what that is is an area that's closed for a certain  
19 use by the people in that area. There exists in the  
20 Federal Fisheries Act a section that says the minister  
21 may make regulations, you know, pertinent to management  
22 of the resource and this, in our opinion, would be a  
23 management of the resource. Make an area closed to a  
24 various use, depending on what weight was given to that  
25 use.

26 Q So if it were the wish,  
27 for example of the people of Tuktoyaktuk during con-  
28 struction of pipelines or gas plants to close the  
29 Husky Lakes to any but their own fishing, then that  
30 would be a possibility if that were a local wish and





Peet, Hunt  
Cross-Exam by Bayly

1 your service were willing to acquiesce?

2 A Yes, I think that what  
3 you had to bear in mind what the exercise of  
4 these type of things is that, you know, O.K. we have  
5 our guideline about the importance of the local voice  
6 in this, but it's at the discretion of the minister  
7 and you cannot treat lightly the fact that you're going  
8 to take large areas maybe and close them off to use  
9 by other people. So, you know, these have to be  
10 weighed and a decision would come <sup>from</sup> our minister, I  
11 guess, in this regard.

12 Q Right.

13 A I'd like to point out  
14 an opposite effect. I wanted to close an area for  
15 commercial fishing to do with Cambridge Bay last year  
16 and there was a representation made to the minister,  
17 much to my chagrin and there's a letter directed to  
18 me and basically my views were, you know, not upheld  
19 in this instance and it came about that they did get  
20 a commercial fishery where I wanted to keep it closed.  
21 So there is a mechanism, you know, both ways for these  
22 things to be look at.

23 Q Well, it sounds like the  
24 local voice can be quite strong.

25 A Yes, that's the point.

26 Q Yes. Now, on page seven  
27 of your evidence, you state that

28 "The sports fishery could be allowed, if it did  
29 not interfere with the domestic fisheries or  
30 deplete the resources"



Peet, Hunt  
Cross-Exam by Bayly

1 and, in your opinion, does the Fisheries Service have  
2 enough information to be able to identify areas of this  
3 nature and --

4 A We have a broad general  
5 information that's based upon this, you know, all  
6 this stuff that's been fortunately given to this  
7 Inquiry. There is evidence from some of DIAND economic  
8 surveys were done in the early sixties and some of the  
9 later stuff was done, particularly by Mr. Bissett.  
10 You know, in connection with the pipeline and in there -  
11 well, you know, the figures are rather fragmentary.  
12 There's a suspicion that -- or would lead, you know,  
13 in the direction that possibly the amount of fish that  
14 are taken domestically now, as opposed that used to  
15 be taken is lower.

16 That from an abundance point  
17 of view, you know, for the fish but because, you know,  
18 there's less being taken because people have turned  
19 from this way of life into other activities, you know  
20 and this fluctuates quite widely.

21 That's a fact. It would seem  
22 to point out to me that, you know, if they wanted to sell  
23 some commercial that were not in the ballpark or  
24 worrying about the level <sup>of</sup> fish that's coming out of the  
25 population. You know, we'd be quite safe. In fact,  
26 those quotas that I listed are that in my opinion is, you  
27 know, a safe level over and above what the domestic  
28 take is now for those designated areas.

29 Q All right. Now, you've  
30 stated in your evidence that there may be enough fish to



Peet, Hunt  
 Cross-Exam by Bayly

1 support a local commercial as well as a domestic  
 2 fishery. Has the Fisheries Management Service looked  
 3 at the possibility that commercial fishermen may want  
 4 to supply some of the pipeline construction camps with  
 5 fish that they catch commercially and whether the  
 6 resource can stand this sort of an increase?

7 A Yes, well I stated in  
 8 there that's an eventuality. It's been talked about,  
 9 but as for a specific request in this regard right now,  
 10 no, I don't know of any that has been made to us. It's  
 11 just that, you know, we've wanted to -- I guess by  
 12 virtue of this evidence show two things. We would  
 13 certainly not be in opposition to that. We would see  
 14 it as a logical development possibly and that  
 15 thirdly we think that we can be easily accommodated  
 16 in most instances now.

17 Although, each time it's  
 18 asked, it has to be site specific. You know, name  
 19 me the lake or the body of water, and then we'll look  
 20 at it.

21 Q All right, now  
 22 on page five of your evidence, you refer in the fourth  
 23 paragraph from the bottom in the last sentence you say  
 24 that:

25 "The report of Barlishen and Webber, 1973, covers  
 26 the history of this commercial development and  
 27 serves to point out the problems associated with  
 28 commercial development in the Territories in  
 29 general and the delta in particular."

30 You don't go in to say what those problems are and





Peet & Hunt  
Cross-Exam by Bayly

1 perhaps it would be useful to just outline what they  
2 were for the record.

3 A Yeah, I'd have to open  
4 my briefcase to get at it. I'm afraid you caught me,  
5 that wasn't the particular thing I thought you'd ask  
6 me and I think the document is in my room. So you know  
7 if you want it specifically I could certainly offer it  
8 to you. It's an internal, not a published publication,  
9 by the Northwest Territorial Government. What it was  
10 done for was there was supposed to be a third part to  
11 these documents and what they were supposed to provide  
12 was case histories of, you know, particular items  
13 such as this. What happened was several of them were  
14 made -- Cambridge Bay, Holmes Creek, the one we were  
15 discussing -- and because of the movement of people  
16 they didn't get put into the third volume. O.K., what  
17 the problems were was this, that it was a great idea  
18 and was looked at. There was problems with getting  
19 the proper type of freezer out there. There was  
20 problems of the thing may be delivered and it didn't  
21 work. There was problems with getting a man out there  
22 to fix it, and that, and missing the fish. There were  
23 several years where they completely missed the fishing  
24 season because the gear wasn't there, or the darn  
25 thing was over in the wrong place, or they wanted to  
26 take the freezer from Holmes Creek and put it over  
27 in another fishery, or they were trying to do several  
28 fisheries at the same time and schedule it. Trans-  
29 portation problems, weather problems because guys couldn't  
30 get out when the darn thing broke down, problems



Pect & Hunt  
Cross-Exam by Bayly

1 with sanitation at the site, you know, the Fisheries  
2 inspection people of our service going in and saying,  
3 "Well, you done a fine job, but you can't do it because  
4 there were eco-choloforms in, you know, the water  
5 that you're washing the fish with," and things like  
6 that. All these kind of problems, and what caused these  
7 is that a good idea maybe, but you know, the planning  
8 was a little bit wrong. A lot of people trying to do  
9 a good thing and not too much co-ordination, so from  
10 1964 I might be wrong about the dates, to about 1967-68  
11 there was a progression of these type of problems and  
12 what happens, you know, the guys who want to fish they  
13 get turned off and then you got a people problem be-  
14 cause they won't work. That's the type of thing I refer  
15 to right there.

16 Q All right, is that  
17 a report ? Perhaps Mr. Ryder can help us out here.  
18 It could be left with the Inquiry <sup>a copy left with the Inquiry</sup> so that we could  
19 have a look at that.

20 A Yes, I can make that  
21 available. I don't know exactly the protocol here but  
22 that is a document that I have access to that really  
23 belongs to the Northwest Territorial Government and  
24 is not published. I don't know.

25 THE COMMISSIONER: Let Mr.  
26 Ryder worry about that. He'll look after all conceivable  
27 problems that may arise.

28 A I just didn't want to  
29 get dinged.

30 MR. BAYLY: Q Have you had a



Peet & Hunt  
Cross-Exam by Bayly

1 look at the evidence of Mr. Hugh Trudeau given in  
2 Inuvik?

3 A No, I'm sorry, I never  
4 had the opportunity to go over that material.

5 Q All right. He suggests  
6 in that evidence that with the construction of a  
7 pipeline and the processing facilities there would  
8 be required an additional number of people on his  
9 Enforcement Force, and would you agree that the  
10 Enforcement Branch would have to be increased in  
11 size?

12 A Yes, I discussed that  
13 particular point with Mr. Trudeau, and I think that  
14 our degree of numbers of people would be at variance.  
15 I myself would think that we would probably need more  
16 than the eight he said. This is a difference of  
17 opinion, but with that statement that if we're going  
18 to, you know,  
19 make changes in catch possession limits and that  
20 type of thing we can sit here -- I can sit and make  
21 rules on paper but unless my department is willing  
22 to enforce them, they are meaningless in the field  
23 and we have to have people out there to look after  
24 that.

25 Q Mr. Peet, could you  
26 put a number on what in your opinion would be a  
27 sufficient force?

28 A I have thought about  
29 it and unless I was completely familiar with your  
30 numbers at camps, people, along the route and this  
type of thing, I wouldn't give you an estimate because





Peet & Hunt  
Cross-Exam by Bayly

1 it's just off the top of my head,

2 Q Would it be possible for  
3 you, prior to the end of the Inquiry. --

4 A I would prefer not to  
5 because I think that what I'm delving into is the  
6 basic ground of Mr. Trudeau and I really think that  
7 he would be the best gentleman to give that estimate,  
8 not me.

9 Q All right.

10 A I would defer to his  
11 opinion. The fact is I'd ask him, "What do you think"  
12 and I'd be largely colored by what he'd think.

13 might  
14 Q You/think there should  
15 be more, but you think his opinion because he's an  
16 enforcement officer is probably the best we can get.

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Peet, Hunt  
 Cross-Exam by Bayly

1                   A     He's the man that has to  
 2     make sure that it's implemented, I'm the guy in large  
 3     part that sits and points out some of this paper. What  
 4     I'd be concerned with is the hypocrisy of making paper  
 5     rules that are not enforced.

6                   MR. BAYLY: Right. Those are  
 7     all the questions I have. Thank you very much gentlemen

8                   THE COMMISSIONER: I have one  
 9     question. What about the Great Slave fishery. You  
 10    didn't include that in your discussion.

11                  A     No sir. We are heavily  
 12    involved in that. The reason why I didn't include  
 13    it was because I you know, tempered my remarks to the  
 14    Mackenzie River Valley. The fishery, from what I can  
 15    see, I don't think there'll be any much, that fishery  
 16    to do with, you know with pipeline construction or  
 17    anything like that. There could be a possibility that  
 18    you know, this could be a source of fish<sup>if</sup> they wanted  
 19    to buy it, you know, the companies up and down that  
 20    river, it might be a good proposition. The only place  
 21    on that fringe where I think there's a critical area  
 22    is the Beaver Lake area where there's a sport fishery  
 23    for grayling and some domestic fishing.

24                  Q     About how many people are  
 25    employed in the Great Slave Lake fishery?

26                  A     I think it's approximately  
 27    I'm not sure if it's 110 licences -- you know there's  
 28    110 boats and skiffs, or if it's 110 people. It's  
 29    about that. They landed just a little over 2 million  
 30    pounds last year. I think that we're talking about



1 approximately 200 fishermen.

2 Q 200 people employed in  
3 that industry?

4 A No, I'm just talking of  
5 the fishermen. Then you take in the plant that's there,  
6 and I don't really know how many people are employed  
7 in it.

8 Q 200 actually employed on  
9 the boats?

10 A Approximately. I temper  
11 that, I might be out by 50%. I should know it, it's  
12 just that it escapes me right now.

13 Q But do you have any idea  
14 on the average how much employment over the course of  
15 a year those people would have out of the fishery.

16 A Tom, maybe you can answer  
17 that better than me. You know the Great Slave Lake.

18 WITNESS HUNT: On the Great Slave Lake ---  
19 WITNESS PEET: I think

20 approximately 2½ months, 3 months. June, mid-June into  
21 July. I'm sorry, early July into August, possibly into  
22 September.

23 THE COMMISSIONER: Right. Any  
24 re-examination?

25 MR. RYDER: No re-examination  
26 Mr. Commissioner, I'd just like to thank Mr. Peet for  
27 taking the time to prepare his evidence for us, and for  
28 coming here, and Mr. Hunt for accompanying him.

29 THE COMMISSIONER: Yes, well  
30 thank you very much gentlemen, both of you. We  
appreciate your help, and your co-operation very much.





1 MR. RYDER: Sir, I should advise  
2 you that Miss Hutchinson has tracked down the Coppermin  
3 delegation, and has found that they're still in  
4 Coppermine, and they won't be attending today. They  
5 apparently were not able to make accommodation because  
6 of the Carnival in Yellowknife, and so perhaps I could  
7 just simply advise Mr. Jackson of that, he can take  
8 it from there.

9 THE COMMISSIONER: Right. Okay,  
10 we'll adjourn then until Monday, a week Monday?

11 MR. RYDER: A week  
12 Monday the fifth, sir.

13 THE COMMISSIONER: Monday the  
14 fifth at 1:00 P.M.

15 (PROCEEDINGS ADJOURNED UNTIL APRIL 5, 1976)  
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347  
M835  
Vol. 136

AUTHOR  
Mackenzie Valley pipeline inquiry:

TITLE  
Vol. 136      26 March 1976

DATE DUE | BORROWER'S NAME

347  
M835  
Vol. 136







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MACKENZIE VALLEY PIPELINE INQUIRY

Government  
Publications

IN THE MATTER OF APPLICATIONS BY EACH OF  
(a) CANADIAN ARCTIC GAS PIPELINE LIMITED FOR A  
RIGHT-OF-WAY THAT MIGHT BE GRANTED ACROSS  
CROWN LANDS WITHIN THE YUKON TERRITORY AND  
THE NORTHWEST TERRITORIES, and  
(b) FOOTHILLS PIPE LINES LTD. FOR A RIGHT-OF-WAY  
THAT MIGHT BE GRANTED ACROSS CROWN LANDS  
WITHIN THE NORTHWEST TERRITORIES  
FOR THE PURPOSE OF A PROPOSED MACKENZIE VALLEY PIPELINE

and

IN THE MATTER OF THE SOCIAL, ENVIRONMENTAL AND  
ECONOMIC IMPACT REGIONALLY OF THE CONSTRUCTION,  
OPERATION AND SUBSEQUENT ABANDONMENT OF THE ABOVE  
PROPOSED PIPELINE.

(Before the Honourable Mr. Justice Berger, Commissioner)

Yellowknife, N.W.T.

April 5, 1976.

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PROCEEDINGS AT INQUIRY

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Volume 137

CANADIAN ARCTIC  
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APPEARANCES:

Mr. Ian G. Scott, Q.C.,  
Mr. Stephen T. Goudge,  
Mr. Alick Ryder and  
Mr. Ian Roland for Mackenzie Valley Pipeline  
Inquiry;

Mr. Pierre Genest, Q.C.,  
Mr. Jack Marshall, and  
Mr. Darryl Carter for Canadian Arctic Gas  
Pipeline Limited;  
Mr. Reginald Gibbs, Q.C.,  
Mr. Alan Hollingworth &  
Mr. John W. Lutes, for Foothills Pipe Lines Ltd.;

Mr. Russell Anthony &  
Pro. Alastair Lucas for Canadian Arctic Resources  
Mr. Garth Evans Committee;

Mr. Glen W. Bell and  
Mr. Gerry Sutton, for Northwest Territories  
Indian Brotherhood, and  
Metis Association of the  
Northwest Territories;

Mr. John Bayly  
or  
Miss Leslie Lane for Inuit Tapirisat of Canada,  
and The Committee for  
Original Peoples Entitle-  
ment;

Mr. Ron Veale and  
Mr. Allen Lueck for The Council for the Yukon  
Indians;

Mr. Carson H. Templeton, for Environment Protection  
Board;

Mr. David Reesor for Northwest Territories  
Association of Municipal-  
ities;

Mr. Murray Sigler for Northwest Territories  
Chamber of Commerce.

Mr. John Ballem, Q.C., for Producer Companys;

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1 Yellowknife, N.W.T.

2 April 5, 1976.

3 (PROCEEDINGS RESUMED PURSUANT TO ADJOURNMENT)

4 MR. BAYLY: Mr. Commissioner,  
5 if I could start with a couple of housekeeping matters.  
6 First of all I have distributed to the participants and  
7 I have left with Mr. Waddell for you, sir, a copy of the  
8 curriculum vitae of Mr. Clive Nicol, and I have distri-  
9 buted and left with Mr. Waddell a copy of a letter  
10 sent by Lorraine Allison to Mr. or Dr. Doug Stephen of  
11 the Canadian Wildlife Service asking some questions in  
12 January, to which we are expecting a reply which has  
13 been prepared to be distributed by Commission counsel,  
14 so that no one can cry "Set up" if we ask some of those  
15 questions when he's on the stand.

16 The other matter I have is a  
17 preliminary draft of evidence of Donald Mackay, who is  
18 a witness that we had at one time intended to call, and  
19 it's entitled:

20 "Spills of oil and hazardous materials in the  
21 Mackenzie Valley Delta and Beaufort Sea."

22 Now, we did not choose to call that evidence but I saw  
23 that he was a name on a list that Mr. Waddell had of  
24 people who intended to make presentations to you in  
25 the south, sir, and I would like to file this as an  
26 exhibit so that other participants will have the oppor-  
27 tunity to look at it and will not say that we have  
28 planted witnesses without notice.

29 THE COMMISSIONER: If you plant  
30 them, you'll give notice, is that what we are to --





1 MR. BAYLY: We will, sir. This  
2 one is one that we don't claim as one of our own but we  
3 did prepare some evidence which may be similar to or the  
4 same as the presentation he might make to you in the  
5 south.

6 (EVIDENCE OF DONALD MACKAY MARKED EXHIBIT 523)

7 MR. GOUDGE: Mr. Commissioner,  
8 in the normal course  
9 'we would like to continue with Dr. Davies' evidence.  
10 Before we do, Mr. Bayly distributed some time ago a draft  
11 of evidence which he proposes to lead through C.W. Nicol,  
12 whose curriculum vitae he distributed earlier today.  
13 Mr. Marshall has indicated that he, I think, has a motion  
14 to make concerning that evidence and I would propose,  
15 if it's convenient, that that be dealt with now.

16 MR. MARSHALL: Sir, Mr. Bayly  
17 distributed the summary of the evidence to be given by  
18 Mr. Nicol pertaining to the "Mizushima" oil spill. I  
19 would have thought that the maxim res ipsa loquitor  
20 would apply. Really I can't see how evidence of this  
21 sort is going to be of much assistance to this Inquiry  
22 dealing, as it does, with a spill of bunker C, I believe  
23 it is, in the Inland Sea of Japan. Perhaps Mr. Bayly  
24 will have some argument that you'll find convincing,  
25 and I might even change my views, but my position on  
26 it simply is, sir, that it's about as extraneous as any  
27 topic I could think of to the work that the Inquiry has  
28 undertaken. On that basis I would suggest that it's  
29 not going to be of assistance to you, sir. It's not  
30 relevant.

MR. COMMISSIONER: Oh, Mr. Hol-  
lingworth, sorry.



1 MR. HOLLINGWORTH: Well, I  
2 share Mr. Marshall's feelings, Mr. Commissioner. I've  
3 had the opportunity to read the prepared evidence of  
4 Mr. Nicol on the way up on the plane. It was diverting  
5 the morning for me, but apart from that I can't see  
6 anywhere that this evidence would be relevant, and when Mr.  
7 Bayly observed just now that he was going to call Mr.  
8 Mackay on oil spills in the Mackenzie Delta, I fell to  
9 wondering why he had decided not to call that and was  
10 instead calling someone who was going to speak about the  
11 spill of a substance that won't be in common use in the  
12 Northwest Territories in an area whose ecology is, as  
13 far as I can ascertain, is so unlike the Mackenzie Delta  
14 that there's just no comparison whatever.

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1 MR. BAYLY: Mr. Commissioner,  
2 I don't feel I have to respond to the reasons that I'm  
3 not calling a witness.

4 THE COMMISSIONER: No, but  
5 Mr. Marshall says "What has an oil spill in the Sea of  
6 Japan got to do with the Inquiry?" That particular  
7 spill, and it was a major spill, was discussed by Mr.  
8 Milne and other witnesses at Inuvik. It's already  
9 been discussed and is illustrative as I understand it of  
10 the severe and even devastating impact that a major  
11 oil spill can have in temperate waters. The point that  
12 Mr. Milne and others made was, that in the Arctic a  
13 spill would be even more severe, the consequences even  
14 more devastating. That's already before me. That  
15 evidence is already in.

16 Now, in what manner will it  
17 assist me to have Mr. Nicol discuss the events relating  
18 to this spill in detail. I recollect that a tank.--  
19 several tanks containing oil onshore burst and a dyke  
20 beyond restraining the tanks was breached as well and  
21 the oil went into the harbor and into the sea, and  
22 thousands of men were mobilized -- as many aircraft  
23 apparently as the Canadian Forces can command were  
24 brought into play, and without success.

25 Now, that's all before me and  
26 no doubt in greater detail than I've already indicated  
27 but that comes to mind immediately. So where do we  
28 go from there? Why do we have to hear more about this?

29 MR. BAYLY: Well, Mr. Commissioner,  
30 I've got eight points to make with regard to the





1 relevance of this evidence and because the motion has  
2 been brought and I prepared it, I intend to make all  
3 eight of them.

4 THE COMMISSIONER: Well, by  
5 all means.

6 MR. BAYLY: In the first place  
7 sir, the evidence of Mr. Nicol is that of an E.P.S.  
8 Canada officer, first in oil spill technology, who was  
9 sent to Japan to observe the extent of damage and the  
10 techniques of cleanup of a massive oil spill in the  
11 Inland Sea of Japan. He's a man with wide experience  
12 including work in the Canadian Arctic on various bio-  
13 logical and other sorts of projects and that was the  
14 reason I have distributed the curriculum vitae at this  
15 time.

16 He suggests in his evidence,  
17 without going into the detail of it, that there are  
18 things that Canada can learn from the Japanese experience  
19 which may relate to the ability and willingness of  
20 Canadians to clean up any oil spill in the Arctic.

21 Now, we have heard, and this is  
22 the second point, from Mr. Hemstock in Inuvik with regard  
23 to the equipment that is available. Government and  
24 industry stockpiles of equipment for the containment  
25 and the cleanup of oil spills. We've heard from Mr.  
26 Pettigrew with regard to a plan which could be put into  
27 action for the cleaning up of major and minor oil spills.

28 We've heard from Mr. Shaw that  
29 we should study oil spills that have existed rather than  
30 doing experimental oil spills so that we can learn from



1 these various experiences; things that may be applicable  
2 in the Arctic. We have outlined for us by Mr. Steigen-  
3 berger at Volume 103 of the transcript at page 15776,  
4 certain techniques that can be used to clean up oil  
5 spills.

6 Now, much of that equipment  
7 and the techniques that are planned for the possible  
8 cleanup of oil spills in Arctic waters and in particular  
9 in the delta and the Beaufort Sea, are either similar to  
10 or identical to equipment used to clean up the spill in  
11 the Inland Sea of Japan.

12 The presentation we would  
13 intend to show you through the evidence of Mr. Nicol  
14 is to show how that equipment works, how it has to be  
15 deployed, how successful it is and therefore, at what  
16 state technology is with regard to the cleanup of spills.

17 Now, what we've heard from  
18 Mr. Marshall is only that Japan is a long way away, and  
19 I'll admit that's true. But I don't think sir that in  
20 light of the fact that we have heard evidence from  
21 various experts in the oil industry who base their  
22 statistics on world wide gatherings of blowout statistics  
23 or the equipment that they use they say is the best in  
24 the world, <sup>be</sup> that we should be precluded from looking at a  
25 major oil spill simply because it occurs somewhere  
26 outside of Canada.

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oil                      It's unfortunate that we don't  
have a major spill to look at in this country in which  
these techniques have been used.

The third point, sir, is that in examining the various points of similarity Beaufort Sea and the Inland Sea we have learned from Dr. Barry in Inuvik, we have learned from Vincent Steen in Tuktoyaktuk, from Johnny Norberg in Tuktoyaktuk, and from Mr. Horsfield of Imperial Oil, also in Tuktoyaktuk, that weather conditions can be very severe in the Beaufort Sea and appear to be similar in wind conditions, current conditions, to those which are experienced in the Inland Sea of Japan.

Now, not only that, but we've heard from Mr. Horsfield that with regard to one incident which took place on an artificial island there was the potential for a smaller but similar tank failure which would have caused some 70,000 gallons of oil to go into the Beaufort Sea, had they not been able to pump it back into some empty tanks on the island. Fortunately, that didn't happen; but these are the possible things that can happen in the Beaufort Sea and you, sir, I submit, should be looking at those and their possible impacts on the people and environment of that area.

Now we've heard -- and this is the fourth point -- evidence from Foothills that tankers may bring as much as 35,000 tons of fuel to Tuktoyaktuk for storage and use in the construction of pipelines. Now perhaps this isn't bunker C, in fact it's very unlikely to be, but certainly it involves storage of





1 large amounts of oil in tanks which are not dissimilar  
2 from the ones that failed in the Inland Sea.

3 THE COMMISSIONER: What is  
4 bunker C, fuel oil for tankers?

5 MR. BAYLY: I believe so, yes.  
6 Presumably this will be kept in storage tanks in Tuktoy-  
7 aktuk. Presumably it will be enclosed with the approp-  
8 riate berms, and I think it's significant and submit  
9 that it is useful to the Inquiry to look at the techni-  
10 ques for safeguarding oil from spilling to see just how  
11 they actually do work where large tanks are involved.  
12 That evidence, for the information of my learned friends  
13 is in Volume 66 of the transcript, the evidence of Mr.  
14 Mirosh at page 9777 and at page 9778, and in Volume 67,  
15 also the evidence of Mr. Mirosh at page 10012.

16 The fifth point is, sir, that  
17 we've heard that topping plants may be installed at the  
18 Imperial Oil facility which involves the possible  
19 production of more than 100,000 gallons per day of  
20 fuel. Now whether that's jet fuel or diesel fuel or  
21 gasoline, I'm not certain. But presumably tank farms will  
22 be required to store this before it can be shipped,  
23 because there's no application to build a pipeline to  
24 ship that amount of oil south. Again if we have problems  
25 with tank failures and the containment of fuels, it  
26 may well be important to look at the problems that have  
27 occurred in other parts of the world.

28 The sixth point is that we have  
29 at this point no idea what kind of oil will be found.  
30 We haven't heard from the producers whether they know



1 exactly what kind of oil will be found, and I doubt  
2 that they do. If oil is found in the Beaufort Sea it  
3 will have to be brought to shore , and some may be  
4 refined locally. There has been some talk of a refinery  
5 at Tuktoyaktuk. That plan appears to have been shelved  
6 at the present, but we have no idea whether one of the  
7 possible impacts of oil and gas development will be  
8 the construction of this sort of facility. There may be  
9 some spills. We've heard the possibility of an oil  
10 blowout, and you, sir, have outlined the evidence we  
11 have heard from Mr. Milne and others.

12 We have heard from Mr. Hnatiuk  
13 at Tuktoyaktuk that if there is an oil blowout in the  
14 Beaufort Sea that he's confident that the oil companies  
15 can clean up all the oil that comes to shore. That  
16 reference, sir, is in Volume 44 of the community hear-  
17 ing transcripts at page 4345, starting at line 13 Mr.  
18 Hnatiuk says:

19 "We do not claim to be able to clean up all of  
20 the oil."

21 Further at line 22:

22 "The oil that got on shore, we hope we would  
23 be able to clean up in its entirety."

24 Mr. Nicols' evidence suggests  
25 that that may not be possible, sir, and if one of the  
26 impacts is that oil is to be left on shore because it  
27 can't be cleaned up or it's too expensive to clean up,  
28 then that is a possible impact of oil and gas development  
29 in the Beaufort Sea , of which you, sir, should be  
30 weighing the consequences and making recommendations.



1 Now, we have also heard from  
2 Mr. Milne that if the oil is not burned off the water  
3 within a period of 24 hours and from Mr. Hnatiuk in a  
4 period of longer than that, that it will change its  
5 consistency, that the volatile substances will evaporate  
6 off and we will be left, especially in cold water, with  
7 a very gummy type of substance, and that, if not bunker  
8 C, is at least similar in consistency to the oil that is  
9 described in the evidence of Mr. Nicol. We're not claim-  
10 ing that we have a witness that knows what kind of oil  
11 is likely to be found in the Beaufort Sea.

12 Now, the seventh point is that it  
13 may be if there is an oil spill whole communities would  
14 have to be mobilized to do any cleanup operations. Mr.  
15 Nicols' evidence, as you have summed it up, sir, from  
16 your knowledge of the spill, says that it involved  
17 many thousands of people and much equipment to clean up  
18 the spill in the Inland Sea of Japan, and if it's  
19 necessary to bring in hundreds or even thousands of  
20 people to clean up an oil spill, to clean up everything  
21 that's onshore, as Mr. Hnatiuk suggests, that will have  
22 social as well as environmental consequences on the land  
23 and the people of the area surrounding the Beaufort  
24 Sea. Now these are possible impacts of petroleum  
25 development in the Beaufort Sea and in the delta.  
26 These aren't just in the abstract or doom's day scenarios,  
27 these are things that have happened, unfortunately,  
28 they've happened in other parts of the world. Mr.  
29 Nicols' evidence suggests that we can learn something  
30 from them, and that in fact there should be





1 international co-operation so that we can learn from  
2 each other in techniques of cleaning up oil.

3 The last point, sir, refers  
4 to the guidelines, your preliminary rulings, and the  
5 order-in-council.  
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1                               With regard to the Order-In-  
2 Council to begin with, at the second page sir, under  
3 item B, you're empowered to look at any proposals to  
4 meet the specific environmental and social concerns  
5 set out in the expanded guidelines for northern pipelines  
6 as tabled in the House of Commons on June 28th, 1972  
7 by the Minister.

8                               Let's have a look at those  
9 guidelines. In the preamble to the guidelines, I think  
10 it's very important sir that the government has said  
11 on the first page:

12                            "In particular, the government is ready to sit down  
13                            with the representatives of the native people  
14                            involved to invite their views on the guidelines  
15                            proposed and reflect these views wherever possible."  
16 And then going to page 13 of those expanded guidelines:

17                            "One of the requirements is that the applicant --"  
18 -- at the top of the page,

19                            "--must document the research conducted and submit  
20                            a comprehensive report assessing the expected effects  
21                            of the project upon the environment."

22 And farther down on the page,

23                            "In responding to these concerns, applicants also  
24                            are to provide documented evidence that they possess  
25                            not only the necessary knowledge but also the  
26                            capability to carry out the specific proposals."

27 Mr. Nicol's evidence sir suggests that knowledge alone  
28 may not be enough because of the difficulties with  
29 weather, with logistics; it may be just impossible to  
30 do what we have the technology to do in the Beaufort Sea.



On page 15, in guideline  
eight,

"It is important to discuss that effective plans be developed to deal with oil leaks, oil spills, pipeline rupture, fire and other hazards to terrestrial, lake and marine habitats that such plans be designed to minimize environmental disturbance caused by containment, cleanup, or other operations and to bring about adequate restoration of the environment, that they been designed to deal with minor and major incidents, whether they are a single event or occur over a period of time, and that they include contingency plans to cope with major hazards or critical situations."

Now, those obligations appear to be obligations of applicants rather than other participants sir, but my clients are the people who live there in the area of the Beaufort Sea, and they're concerned that if the technology is available that it be discussed. If it's impractical to deploy the equipment, that the applicants have said that they have, then that should be before you sir.

If we're not looking at the possibility of an oil blowout, we may well be looking at what is described in this guideline as rather than a single event, an event that occurs over a period of time such as a series of pipeline or feeder line breaks from under the sea, or perhaps a series of tank failures, or perhaps a combination, or perhaps the discharge of bunker C or other fuels by tankers that are using the





1 Beaufort Sea to supply and help with the logistics of  
2 the pipeline.

3 Lastly sir, referring to your  
4 preliminary rulings number one, at page three. You  
5 have stated that:

6 "This Inquiry is not just about a gas pipeline. It  
7 relates to the whole future of the north."

8 And farther down in that paragraph:

9 "The impact of the pipeline should be considered  
10 in the context of the development of a Mackenzie  
11 Valley transportation corridor."

12 Sir, you have heard evidence  
13 both in Inuvik and here that the potential for oil and  
14 gas finds is offshore and that an oil pipeline may well  
15 be included in the corridor chosen for a gas pipeline.

16 You state at page four,  
17 following up on that point:

18 "It would be a mistake to dismember the corridor  
19 envisaged by the pipeline guidelines and to con-  
20 sider the gas pipeline in isolation."

21 It appears therefore that it  
22 is a responsibility of those bringing evidence to the  
23 Inquiry whether they be applicants, participants or  
24 Commission Counsel to help to bring before you sir some  
25 of the problems that may be related to both the  
26 corridor and contingency plans.

27 You speak at page 11 of that  
28 heading D, ruling under the , "Gathering Lines and Gas Fields";  
29 you say:

30 "I regard it as essential to this Inquiry that I



1 should consider evidence regarding the gas fields  
2 in the delta and the gathering lines to be built  
3 in the delta."

4 We've heard evidence that gas and oil may be found in  
5 combination together and they may be found under the sea.  
6 It may be that any oil spill may result from the various  
7 feeder lines that would bring oil onto the land.

8  
9 You state further at the  
10 bottom of page 11 and going onto page 12:

11 "So it will be the responsibility of Commission  
12 Counsel to obtain evidence pursuant to  
13 if necessary to enable this Inquiry to consider the  
14 location and extent of the gasfields in the delta,  
15 the likely extent of further gas exploration in  
16 the delta and the Beaufort Sea, the likely location,  
17 design, and construction of the gathering lines  
18 and the processing plants that will be needed to  
19 render the gas acceptable to the trunk pipeline, and  
20 the social and environmental and economic impact  
21 that the development of the gas fields and the  
22 construction of these lines will have in the delta  
23 and elsewhere in the north."

24 Well, I submit sir that if we  
25 do not look at what has actually happened in this world  
26 that may be able to teach us something about the possible  
27 social and environmental impacts in the Beaufort Sea,  
28 then we are missing a chance to look at information that  
29 may be relevant to the making of recommendations to the  
30 government which is relying on this Inquiry.

Now, at some point, I assume



1 we'll be hearing from the applicants with regard to  
2 their contingency plans and their evidence with regard  
3 to the problems that may be associated with placing an  
4 oil and a gas pipeline in the same corridor. Now, so  
5 far, we haven't heard anything from them sir and we're  
6 not prepared to wait for that. We don't know whether  
7 we'll be satisfied with it or not, but we wish to present  
8 to this Inquiry evidence of the problems, not only the  
9 present problem, I'm sorry, the problems that occur in  
10 the physical part of the cleanup, but Mr. Nicol will be  
11 giving in his evidence, a follow up view that he had  
12 the opportunity to make, of not only the cleanup opera-  
13 tion but the social effects that both cleanup and the  
14 various assessments of the cleanup had; in other words,  
15 the monitoring of the cleanup of this spill and how  
16 satisfactory it appeared to be in the eyes of the various  
17 groups and people involved.

18                   Lastly sir, Mr. Nicol is not  
19 a man without northern experience. Mr. Marshall has  
20 made comments that Mr. Nicol has studied the martial  
21 arts in Japan and indeed he has done so and put that into  
22 his curriculum vitae. But, that's a bit unfair to the  
23 man sir, because he has done a number of other things and  
24 he has spent many seasons in the Arctic studying the  
25 environment, studying the weather, studying the fish.  
26 He has also been employed from September 1971 to January  
27 1974 with the Fishery Research Board of Canada as a  
28 technician in the Freshwater Institute of Winnipeg.

29                   From September, 1971 to  
30 September, 1972, he was in charge of logistics and





1 technical support for the Fisheries Research Board  
2 pipeline impact studies under Dr. G. Brunskill and  
3 Dr. N. Snow. Now this may be an inappropriate time to  
4 bring up the qualifications of a witness; that's  
5 certainly something Mr. Marshall can contest, if and  
6 when Mr. Nicol's evidence is allowed in. But I  
7 just put this to you, sir, because Mr. Marshall did  
8 suggest that I was calling someone who might not be  
9 qualified to give the evidence that he has  
10 been giving. He is also a man who is a technician  
11 employed by the Environment Protection Service to  
12 regulate the cleanups of oil spills in the Pacific  
13 Ocean.  
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2 I submit that his experience  
3 will not only be valuable but will enable us to base  
4 recommendations to you to pass onto the government in  
5 the area of contingency plans for the cleaning up of  
6 oil spills.

7 MR. BELL: Mr. Commissioner,  
8 I'd like to speak in support of the reception of this  
9 evidence. I think that when we're dealing with evidence  
10 of analogous or parallel cases, there are several points  
11 that we ought to keep in mind, and I think to suggest  
12 that a distinction between the evidence offered and the  
13 terms of reference of the Inquiry as it relates to place  
14 and time of the incident would lead to the exclusion  
15 of a lot of helpful evidence. I would suggest, sir,  
16 that if the parallel case that we're considering seems  
17 to be -- seems to have some prima facie validity, that  
18 is it doesn't carry its discount on its face, it concerns  
19 something which appears at least to be analogous  
20 to what's happening at this Inquiry, then I think that  
21 we can't really object to it on that ground. This  
22 evidence concerns an oil spill on the ocean, basically,  
23 and I think that that gives it something which merits  
24 our attention, at any rate.

25 Another consideration I think  
26 we should take into account concerns the significance  
27 of the point of the parallel case or the analogy. Is  
28 it a point that is really going to help to advance the  
29 Inquiry? As I understand the evidence from a brief  
30 perusal of the summary, this evidence concerns the  
-- well, apart from the description of the oil spill at



1 "Mizushima", it also concerns the state of technology  
2 concerning the cleanup of that oil spill, in other  
3 words remedial measures in addition to the problems  
4 that such oil spills cause .

5 I think another point we have  
6 to consider is the amount of evidence we've already  
7 received on this point, and there has been some on this  
8 point, but I think that it has related mostly to the  
9 nature of the problem and not to the remedial measures  
10 that might be applied to solve the problem.

11 So in view of these types of  
12 considerations, I think that this is evidence which would  
13 assist the Inquiry and which should be received, and  
14 from a brief perusal of the resume that was distributed  
15 it appears that Mr. Nicol is qualified to speak to  
16 this point, so I would urge that it be received.

17 MR. GOUDGE: Very simply, sir,  
18 I take the position that the Inquiry ought to hear the  
19 evidence simply because it's a valid analogue evidence  
20 in dealing with the prediction of impact, the predictions  
21 of what will happen under certain circumstances and  
22 those matters are fundamental to your mandate.  
23 Analogue evidence is one valid source of authority.  
24 Analogue evidence as to what has happened in cases that  
25 may be similar in the past. My view of the draft evidence  
26 that I've read indicates to me at least that the evidence  
27 does deal with matters that we have dealt with in  
28 Inuvik, an oil spill, its cleanup, and the impact of  
29 the spill. The fact that it took place in Japan does  
30 not negate the substance of matters that it addresses.





1 It seems to me, sir, that because it deals with an  
2 analogous situation relating to issues that we have  
3 canvassed at some length in Inuvik, that the evidence  
4 ought to be heard by the Inquiry. I must say, sir, that  
5 I would anticipate that it would be not only proper  
6 but bound to occur, that if the evidence were omitted,  
7 arguments would be made at the end of the day as to the  
8 degree to which the analogy applied, and obviously  
9 arguments can be made that the analogy is close; argu-  
10 ments can be made that the analogy is not close enough  
11 to warrant conclusions of the kind that may be drawn  
12 from it; but that goes to its weight, the degree to  
13 which the analogy applies in my respectful submission  
14 goes to its weight.

15 The fundamental proposition I  
16 support is that the evidence should be admitted because  
17 it's an analogue situation, analogous to issues that  
18 we have dealt with at some length previously.

19 MR. MARSHALL: I guess I'm one  
20 of those people who never learn, and I should have  
21 realized that objecting to some of Mr. Bayly's evidence  
22 going in probably takes more time than hearing the  
23 evidence, but be that as it may, I thought I should  
24 make it clear that I hadn't suggested that Mr. Nicol  
25 was not qualified to speak to those subjects. If I  
26 created that impression, Mr. Bayly, I don't wish to  
27 leave it.

28 It seems to me that the point  
29 is a fairly straightforward one. You, sir, have ruled  
30 that you would hear evidence as to activities in the



1 Beaufort Sea. Now I've lost that argument, so I accept  
2 that you consider that to be relevant.

3 Now it seems to me that taking  
4 off from that point that Mr. Bayly may have chosen to  
5 use Mr. Nicol to make some points to the Inquiry.  
6 He may have tried to get Mr. Nicol to do the analogy  
7 that my learned friend, Commission counsel, suggests  
8 might be useful; but he hasn't done that, sir. He's  
9 given us a story about what happened in Japan, and I'm  
10 sure his observations are accurate and it's very inter-  
11 esting and fascinating. What might be relevant to your work,  
12 sir, is the making of the analogy itself, saying, "Now  
13 I know because of what I have seen that this is what  
14 we're going to be faced with in the Beaufort Sea."

15 Now that, sir, would help you.  
16 Now had Mr. Bayly chosen to use Mr. experience  
17 and expertise to get that point across to you, well and  
18 good; but he chose not to do that, sir. He chose to  
19 have Mr. Nicol relate some observations he made about  
20 what happened in Japan. Now all of the points that  
21 have been made in argument by Mr. Bayly in my submission  
22 can't be made by Mr. Bayly. Those have to be made by the  
23 witness to relate and to make relevant the evidence as  
24 to what happened in Japan to what might happen in the  
25 Beaufort Sea has to be done by somebody who's an expert,  
26 and we lawyers all appreciate that we're not.

27 That's the only value that you  
28 might get out of Mr. Nicol and that might be of great  
29 value. I'm not suggesting that it isn't, but the witness  
30 in this evidence hasn't done that. He's told us a story



1 of something that happened thousands of miles away which  
2 may or may not have any relevancy to any situation, any  
3 scenario that one might develop for the Beaufort Sea.

4 On that basis -- and that's the  
5 way Mr. Bayly's prepared it and had it presented to us --  
6 it's my submission it simply isn't relevant.

7 MR. BAYLY: Mr. Commissioner,  
8 I suggest that Mr. Marshall would do well to read  
9 pages 36 and 37 of Mr. Nicol's evidence, which do just  
10 that.

11 THE COMMISSIONER: Well, I'll  
12 think about what you people have said and let you know  
13 at 9:30 in the morning whether I'll admit this evidence.

14 MR BAYLY: Is there any possi-  
15 bility, Mr. Commissioner, of us hearing before that, as  
16 I have Mr. Nicol booked on a 7:30 in the morning flight  
17 from Vancouver?

18 THE COMMISSIONER: Maybe we'll  
19 have an extended coffee break a little later.

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1 MR. MARSHALL: Mr. Commissioner,  
2 before Commission counsel turns to other matters, I  
3 have a few housekeeping things I ought to do as well.

4 First I have some items that  
5 should be filed as an exhibit. I have an errata sheet  
6 for Section 14-DN, environmental statement, I have copies  
7 for counsel. This relates to the consolidation filing  
8 and third amendment to applications.

9 I have the report by Aquatic  
10 Environments Limited, entitled:

11 "Effects of Methanol on the Fertilization  
12 Process of Chum Salmon,"  
13 dated March of '76.

14 (ERRATA SHEET FOR SECTION 14-DN, ENVIRONMENTAL  
15 STATEMENT OF CANADIAN ARCTIC GAS MARKED EXHIBIT 524)  
16 (EFFECTS OF METHANOL ON FERTILIZATION PROCESS OF  
17 CHUM SALMON BY AQUATIC ENVIRONMENTS MARKED EXHIBIT  
18 525)

19 MR. MARSHALL:

20 We have sufficient  
21 copies for distribution, I think, and then some. . Also  
22 a progress report on the effects of methanol on the  
23 microflora of Arctic soils by R.D. Bryant.

24 (PROGRESS REPORT ON EFFECTS OF METHANOL ON MICROFLORA  
25 OF ARCTIC SOILS MARKED EXHIBIT 526)

26 MR. MARSHALL: Next a progress  
27 report, 1975,

28 "Tundra Rehabilitaton research, Prudhoe Bay and  
29 Palmer Research Centre."

30 Done by the University of Alaska.

(PROGRESS REPORT ON TUNDRA REHABILITATION RESEARCH



BY UNIVERSITY OF ALASKA MARKED EXHIBIT 527)

MR. MARSHALL: Next document that I referred to but -- at the last session, but I don't believe we had sufficient copies for distribution, is a report of Aquatic Environments Limited entitled:

"Water Availability along the Proposed Arctic Gas Pipeline Route from Prudhoe Bay, Alaska to the Mackenzie Delta, Northwest Territories," dated April 2nd, '76.

(AQUATIC ENVIRONMENT'S REPORT ON WATER AVAILABILITY ALONG PROPOSED ARCTIC GAS PIPELINE FROM PRUDHOE BAY TO MACKENZIE DELTA MARKED EXHIBIT 528)

MR. MARSHALL: Finally, sir, I have a list of reports of which copies have not been made for distribution. Some of them are quite voluminous. The list of reports is dated April 4, 1976. I will file a copy of this list as an exhibit and distribute copies of the list to counsel. Some of the reports on the list contain detailed engineering information and I should indicate to counsel now that Arctic Gas reserves the right to take a position with respect to any of the reports set out in this list that the information contained in them is proprietary, and we may, sir, if the occasion arises, ask that we not be required to provide copies of the reports on this list to the various parties. But I am listing them now so as to make disclosure of the fact that these reports are in existence.

(LIST OF REPORTS DATED APRIL 4, 1976 MARKED EXHIBIT 529)



G.S. Davies  
In Chief

1 MR. MARSHALL: That's it, sir.

2 MR. GOUDGE: Yes, Mr. Commissioner,  
3 if we could recall Professor Davies to the stand, we  
4 would like to resume with his evidence as the next  
5 matter of business.

6  
7 GORDON S. DAVIES, resumed:  
8 DIRECT EXAMINATION BY MR. GOUDGE (CONTINUED):

9 Q You will recall, Mr.  
10 Commissioner, that Dr. Davies began his evidence on  
11 January 16, 1976, and that appears at page 16964 of the  
12 transcript, Volume 111. He at that time used some  
13 slides in his presentation. He has those with him. We  
14 don't propose to show them again, but should anybody  
15 wish in cross-examination to refer to them, they're here  
16 and available.

17 As well, I have copies of his  
18 evidence in chief which we were part-way through so  
19 that if counsel or others wish a copy of it they can  
20 simply ask for one.

21 Dr. Davies, we were at page  
22 13 of your prepared evidence, question 14, when we  
23 broke on January 16th. Could I ask you, please, if you  
24 might in summary form, so that you'll get our minds  
25 back on track, review the evidence that you presented  
26 to that point?

27 A Yes. By way of review  
28 as I understand it, the concern of this Inquiry is to  
29 be sure that if either of the projects described in the  
30 applications we are considering here is implemented, that all





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In Chief

1 possible steps be taken to minimize the ensuing environ-  
2 mental disruption. Now there are a number of measures  
3 that can be taken to minimize environmental damage, and  
4 they fall generally into three broad categories:

5 . Those that are concerned with the location or the  
6 siting of the project.

7 . Those that are concerned with environmental  
8 engineering, and these are the design features or  
9 devices which attempt to minimize environmental disruption.

10 . We have inspection programs. These are the on-  
11 going monitoring or surveillance programs that are  
12 carried out during construction and operation of the  
13 project.

14 All of these measures are  
15 important, but I consider the most important is corridor  
16 or route selection. Now given a good environmental  
17 route alignment in engineering we can produce a pipeline  
18 with minimal environmental impact. Given a poor choice  
19 of alignment, no amount of engineering will reduce  
20 disruption to a tolerable level.

21 In the evidence I presented  
22 earlier in these proceedings, I detailed in a somewhat  
23 lengthy appendix my concerns on the shortcomings of the  
24 CAGSL application in this regard. I was not present,  
25 unfortunately, at the hearings in Inuvik, but I have  
26 had an opportunity to read the prepared evidence concern-  
27 ing the cross-delta route, and I've also read some of  
28 the cross-examination of that evidence. My concerns  
29 over route selection have not been set to rest yet.

30 The burden of my evidence today



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is that neither of the pipeline companies or any other participant in the hearings can say on the basis of the present methodologies that have been used that any one of the routes still under consideration is to be preferred over any other. If any one of the applicants were to use a procedure or procedures similar to the ones I described, it would be open to the Inquiry, to the country at large, including the Cabinet, to see how these decisions were made and debate them.

So in part, sir, I'm referring to form, it's true, but form is in fact based on structure or information. So the two are inextricably linked.

In Appendix "D" of my prepared evidence I described several approaches which can be used to evaluate alternative routes, and these by no means stretch the available procedures that we do have, but the ones I mentioned include the choice method, the ranking method, the rank base value method, the appraisal method, and the rating method.

Now it wasn't my intention earlier in this Inquiry to get -- to try and drum up any interest in <sup>any of</sup> these methods per se. Simply that approaches do exist within the professional consulting industry which have systematized to some degree the process of route or site selection. So I will not review these methods again. What they do, I think, is to establish the effectiveness of each alternative based on the total list of objectives.

The evaluation of each alternative according to the effectiveness of each separate



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1 issue, though, is massed, and the cost effectiveness  
2 method is one of several approaches which can help  
3 solve this problem, and this was also described in my  
4 prepared evidence.

5                   Once again, it's only one of  
6 several approaches to coping with individual issues.  
7 Now, the above evaluation procedures require that  
8 scoring techniques be developed for measuring objective  
9 attainment, and a number of techniques were described  
10 which can be used in formulating scoring functions.  
11 It is important to develop the objectives for route  
12 selection at the outset because it is necessary to  
13 devise a data-gathering system which will collect  
14 information that will be useful in determining objec-  
15 tive attainment, and I think this is a very important  
16 point that I didn't emphasize to any extent last time  
17 I was here. One must start out a project of this  
18 dimension with some clear objectives in mind, and then  
19 you have to understand how it is you might measure  
20 whether or not these objectives are met by any one  
21 of the alternative proposals that you're considering.  
22 Because if you can't measure whether or not the  
23 objectives are to be met, then obviously an approach  
24 like I'm suggesting is not very relevant.

25                   So by establishing some  
26 criteria which will allow you to measure this objective  
27 attainment, then you can set up a sampling program  
28 with it, whether <sup>it be</sup> biological, geological or what have  
29 you, which will in fact look at measureable phenomena.  
30 So in other words, there is an importance attached





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1 to timing here. If you don't have clearly set objectives,  
2 and criteria, but later on in the game try to develop  
3 them, it's quite obvious that you may not have adequate  
4 data to do this.



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At the consulting company for which I work, we tend to develop very simple objectives, very few in number. They tend to be what people would call in the trade, I suppose, "motherhood statements", but we think they serve the purpose and for example, looking at a route alignment, you might say that one objective of any of your route alignments is to minimize the impact on terrestrial environment. Now, that doesn't tell you very much.

But then, how you go about measuring, -- but it is in fact, I think anybody would agree, it's a desirable objective. One of several you might consider.

Well, the point is then, how do you measure whether or not you're going to minimize impact on terrestrial environment? Well, you do it in a number of ways. The simplest one could obviously be, set up a criteria that says what is the total acres lost of land, depending on which alternative you select? Now, that's a very simplistic one. It might be possible to get <sup>a</sup> more sophisticated approach by breaking down the kinds of acreages that are lost, for example, wildlife habitat loss. What kind of habitat is it that's lost? Is it habitat used for mating? Or is it habitat that's used for feeding? I think it's possible for biologists to tell us what, you know, what importance they attach to various kinds of habitat.

So, from the beginning, then, you develop the objective. You develop a set of criteria which can become quite extensive. In each case



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1 these criteria have attached to them things which can  
2 be measured.

3 Obviously, in systems like this,  
4 subjectivity is involved because we weight objectives,  
5 not all objectives may have the same importance and we  
6 also weight criteria because not all criteria may have  
7 the same importance. But in any case, the criteria  
8 themselves are based upon measurable functions and this  
9 is where the objectivity of the process comes in.

10 So, you have three steps. At  
11 least two of them are subjective but they are explicit  
12 and so therefore lend themselves to inspection.

13 Now, one impression that I may  
14 have left last time is that using the approach similar  
15 to the ones I have described is sort of the sum of the  
16 decision making process. Well, this isn't true. It's  
17 an aid in the decision making process just as the environ-  
18 ment impact statement for example is an aid in the  
19 environmental assessment process. It's not the only  
20 thing you use. It's one of the most important tools  
21 but we find that using this kind of approach, using  
22 one of these alternative route selection procedures is  
23 an aid in helping us to determine which is the best  
24 alternative. But, we use it in consort with other inputs  
25 of information. There are certain intangibles that no-  
26 body would care to try to measure. Public reaction,  
27 for example, to certain alternatives. Or, we also  
might want to incorporate into our decision making  
process the cost of the alternatives.

So, it's one important method





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1 which is supplemented by additional approaches and I  
2 think that takes us more or less to where we got last  
3 time.

4 Q Yes Dr. Davies, if I  
5 could then pick up with question 14 in your prepared  
6 evidence at page 13, most of the methods you've discussed  
7 establish the effectiveness of each alternative based  
8 on the attainment of the total list of objectives. It  
9 appears that in spite of the best efforts by planners  
10 and engineers, conflicts between some objectives are  
11 inevitable.

12 The problem as to which objective  
13 is more important arises and the discussion is required  
14 on what to sacrifice of one objective in order to gain  
15 something of the other. Is it possible to approach this  
16 problem in some systematic way?

17 A Yes, but I think we should  
18 first establish that this kind of analysis is required  
19 at essentially three different times during the planning  
20 and execution of projects of the type that we are con-  
21 sidering in this Inquiry.

22 First while evaluating and  
23 selecting the preferred corridor and secondly, while  
24 selecting the best route within the corridor. Thirdly,  
25 when you're considering <sup>route</sup> refinements during the final  
26 design process. Fourthly, during construction when a  
27 decision is to <sup>be</sup> made concerning minor adjustments con-  
28 cerning the alignment.

29 I think it is clear that  
30 generally speaking, if the analysis has been done well,



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1 the importance of the trade-offs declines with the  
2 sequencing of the above steps.

3 The theory behind trade-off  
4 analysis is best illustrated with the following con-  
5 flicting objectives:

- 6 1. By how much is construction cost increased if  
7 a route is shifted to avoid the displacement  
8 of a number of families, for example in  
9 community A?
- 10 2. How much open space must be taken to reduce the  
11 number of displaced families by 50 percent?
- 12 3. How much more will a right-of-way cost be  
13 increased if the route location is shifted so  
14 as to reduce the infringement on I.B.P. sites?

15 Well, considering the trade-off  
16 between families displaced and construction costs, we  
17 can illustrate the concept and so Dr. Fyles, I wonder if  
18 I could ask you to perhaps turn on the projector at this  
19 point?

20 I might add just by way of a  
21 cautionary note that I don't want to go off into the  
22 details of this analysis. It's just that the approaches  
23 exist and these are selected just to demonstrate this  
24 capability.

25 I hope you can see that figure,  
26 Mr. Commissioner. The graphical concept is illustrated  
27 in the figure on the screen in terms of a trade-off  
28 curve AA. Has it settled down yet? O.K.

29 To reduce the number of  
30 families displaced from D-1 to D-2, the construction



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1 cost is increased from C-1 to C-2 or in other words,  
2 there's a difference in cost which you could obtain by  
3 subtracting C-1 from C-2.

4 The next slide --

5 THE COMMISSIONER: Excuse me.

6 A Yes.

7 THE COMMISSIONER: All right.

8 Now that we -- I understand this and you have drawn that  
9 curve. What I am a little at a loss to know, is how  
10 does drawing that curve assist you? What does that  
11 curve reveal that wasn't apparent to us before you drew  
12 the curve on the slide? Am I missing something or --

13 A No. I think it just  
14 shows you what the trade-off is, if you select an ob-  
15 jective to set an alignment which will displace in this  
16 mythical example a minimum number of families. You can  
17 see associated with that, a cost of achieving that ob-  
18 jective. Now, since you can't optimize on every ob-  
19 jective you have, what you are essentially looking at here  
20 is the trade-off in dollar costs which a changing number  
21 of families displaced. So, since you have a finite amount  
22 of money in your budget, you may not select the cheapest  
23 one, but if you select an alternative which has a higher  
24 cost, you'll know precisely what the trade-off has been  
25 in terms of numbers of families associated.

26 THE COMMISSIONER: Right.

27 A Could I have the next  
28 slide please, Dr. Fyles? This next figure illustrates  
29 a family of "preference" curves. You can see them shown  
30 on the illustration as curves PP, QQ and RR. Any one





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1 of those single curves such as PP for example, will show  
2 all the combinations of number of families displaced and  
3 construction costs which are equally acceptable. For  
4 example, on curve QQ, if you just consider that one,  
5 the combination of D-3 and C-3 is equally as acceptable  
6 as the combination of D-4 and C-4. In other words, the  
7 total cost to society is the same no matter which one  
8 of those combinations you choose. O.K.

9 THE COMMISSIONER: Would you  
10 repeat that?

11 A Well in any one of those  
12 preference curves, if you stay along one of the curves -

13 Q Right.

14 A -- such as QQ as the one  
15 illustrated, if you look at the combination of D-3 or  
16 C-3, or the other combination shown D-4 and C-4, the  
17 dollars cost to society are equally acceptable. That's  
18 all it says. It's the total cost of achieving the  
19 project will be the same.

20 What it implies, and it's not  
21 very clear there and I'm not much of an economist, is  
22 that there is a dollars cost associated with families  
23 displaced in addition to construction costs.

24 Q You are adding the cost  
25 to the entrepreneur so to speak with the cost of society?

26 A That's correct. Now,  
27 on the other hand, any combination on that graph there,  
28 on preference curve PP is more acceptable than any  
29 combination on preference curves QQ and RR. In other  
30 words, the closer you get to the origin of that graph,



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1 the more acceptable is the project. The further away  
2 you get, the more costly and the less acceptable it is  
3 to society at large.

4 Thus, all things considered,  
5 the preference curve suggests that an alternative should  
6 be chosen which is on a preference curve as far to the  
7 left and down if possible and if we can look at the next  
8 slide, the point five in the illustration below is  
9 the most acceptable of the available options and any  
10 alternative closest to this point maintains optimum  
11 combination of both objectives. So what you're really  
12 doing then is looking at the tangent of that trade-off  
13 curve as being the optimum place, so if you can get an  
14 alternative which comes close to that, then you have the  
15 best alternative with respect to the issue.



THE COMMISSIONER: This slide

A I hope so, yes.

Q Well, look at the numbers,

A I unfortunately can't see

Q Well, it looks to me as

A I can't see that far,  
I'll take your word for it and  
is that the intersection of the  
is a "2" then you can substitute  
5". In other words, it's the  
ine touches the middle preference

Q But at any rate, what  
d on figure -- this figure at

A Yes, that's right.

MR. BAYLY: I don't know where  
diagram <sup>now</sup> / at all. Is it to be  
be on top?

A It's to be as your figure

Q It should be "1, 5, 2".

A Yes, that's correct.





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1 The numbers are not important except as I referred to  
2 them, they have no intrinsic significance. It's the  
3 point once again where the curved line touches the  
4 lowest preference curve, which is the optimal point.

5 THE COMMISSIONER: Yes, well  
6 I think that we understand that.

7 A Well, if I should go on  
8 then, I would say that the development of the tradeoff  
9 curve should be restricted only to the objectives  
10 in conflict, and displays can assist various community  
11 groups in reaching better agreement, and that may be  
12 debateable after seeing this one.

13 However, <sup>if</sup> further groups within  
14 the community continue to have different preferences  
15 then agreement is unlikely, the application of true  
16 preference curves could be adapted. In fact I think  
17 I'd like to recant that and say that this is the theory  
18 behind the way you would present it to a community but  
19 I don't think you'd necessarily present it in the theor-  
20 etical form I have done here.

21 If further groups within the  
22 community continue to have different preferences and  
23 agreement is unlikely, the application of true preference  
24 curves could be adapted and the next figure illustrates  
25 that group A and group B would pick radically different  
26 alternatives and this latter application of tradeoff  
27 curves does not solve the preference problems, however  
28 it does define the cause for further evaluation.

29 That's demonstrated once again  
30 graphically on that slide.



G.S. Davies  
In Chief

1 In the final analysis, trade-  
2 off decisions at this level are political or at any level  
3 and follow an approach similar to that -- in an approach  
4 similar to that described above, will increase the  
5 chances of decisions being taken which will represent  
6 an effective compromise between the parties and the  
7 proceedings.

8 MR. GOUDGE: Have the  
9 methods you described been used elsewhere?

10 A Yes. Anybody interested in  
11 the application of these methods can consult any one of  
12 the several examples I filed with the Inquiry earlier.  
13 These studies are listed and annotated in Appendix C.  
14 They only represent a small sample of the studies that  
15 are available. I have included in Appendix E of my  
16 prepared evidence a detailed description of how a  
17 simple scoring technique was used to aid in the selec-  
18 tion of alternative sites for a large industrial  
19 facility. This material is included in order to more  
20 clearly explain the relationship between descriptive  
21 measurements, criteria and scoring functions.

22 Q Have these methods been  
23 applied with any success?

24 A Yes. They have been used  
25 most effectively, I think, in the selection of alterna-  
26 tive highway and electrical transmission line alignments.  
27 It's been used -- approaches like these have been used,  
28 for example, in Manitoba, in New Brunswick, and in  
29 Ontario quite extensively. In each of these examples  
30 a decision-maker can see how environmental tradeoffs  
are being made with respect to the evaluation of route



G.S. Davies  
In Chief

1 alternatives. He is able to evaluate them in his own  
2 mind because the criteria used in making the decisions  
3 were made explicit and the scoring or ranking model  
4 explained in detail. In many of these examples, he is  
5 further able to see the preferences of various sectors of  
6 the public, and I mean by that, that in Ontario, for  
7 example, when you have the problem of selecting alter-  
8 native highway alignments, this type of scoring exercise  
9 or something similar to it that I've described is carried  
10 out not only, for example, by <sup>a</sup>professional consultant  
11 team but it's also carried out by, for example a team  
12 comprised of individuals selected from the public, and it  
13 may also be carried out by a team of individuals  
14 selected from regulatory agencies using the same objectives  
15 and factors.

16 THE COMMISSIONER: Well, excuse  
17 me. In Ontario is this done -- I think you said this  
18 in January but I've forgotten -- is this done through  
19 the egress of a public agency or department of govern-  
20 ment?

21 A Yes, there's an Environ-  
22 mental Impact Assessment Act in Ontario which requires  
23 an environmental impact statement be prepared. It's not  
24 been proclaimed, but many projects are already  
25 acting under the spirit of that Act, and the statement  
26 is made public, but what I was referring to here is that  
27 the particular evaluation which I'm referring to is  
28 actually carried out by the proponent of the project,  
29 not only by his professional consultants but the pro-  
30 ponent will also go to the public and say, "Look, we're





G.S. Davies  
In Chief

1 very interested in finding out what your input is.  
2 Here are the dimensions of the problem. Have you got  
3 the time and the interest to participate in this kind  
4 of assessment with us because we want to evaluate your  
5 input as well as that of professionals."

6 People have in fact done this  
7 on several occasions, as I mentioned earlier, and so  
8 what happens for example when a decision does become  
9 a political one is it's possible to look at the outcome  
10 of many different groups appraising the same problem,  
11 using a similar approach. So the politician on the one  
12 hand can look at what the professionals are saying  
13 about the job; he can look at what the regulatory  
14 agencies are saying about the job; he can also look  
15 at what certain sectors of the public are saying about  
16 the job and that kind of analysis, and I think it's  
17 quite useful. One or two of the studies tabled here  
18 in the Inquiry have made explicit that approach and  
19 given examples.

20 MR. GOUDGE: Finally, Dr.  
21 Davies, in light of your evidence could you tell us how  
22 any of the above methodologies could be used by the  
23 Inquiry or the applicants at this stage of the  
24 proceedings?

25 A Yes, I wrote this, as you  
26 know, much earlier, Mr. Goudge, but I think it's still  
27 relevant. There are a number of decisions yet to be  
28 made concerning the CAGSL route alignment. The most  
29 important alternatives still under consideration include  
30 the old prime route, or what I understand to be the



G.S. Davies  
In Chief

1 | circum-delta route versus the cross-delta alternative,  
2 | and also there are or should be a number of route  
3 | refinements that will be made during the final design  
4 | process.

5 | I think the applicant should  
6 | re-evaluate the above alignments, or any new ones he  
7 | cares to consider using an appropriate methodology.  
8 | If the data base is adequate, the Arctic Gas experts  
9 | could simply familiarize themselves with an appropriate  
10 | selection procedure and apply it. After this kind of  
11 | analysis, which is not expensive or time consuming,  
12 | the experts may agree in full, in part, or not at all  
13 | with their original selection. I don't mean this to  
14 | be a facetious comment because as I pointed out earlier  
15 | in the Inquiry, we have often sat around the table  
16 | with a group of experts and agreed, you know, that such  
17 | and such a site or such and such an alignment obviously  
18 | seemed to us to be the best one, and yet upon applying  
19 | some more rigorous definition of our objectives, quite  
20 | often we have been surprised to find out that the  
21 | intuitively favored route or site was not at all an  
22 | appropriate one.

23 | In either case, by using a  
24 | systematic approach it will then become open to the  
25 | Inquiry and its participants to see how the decisions  
26 | were made and debate them.

27 | If the original assumption that  
28 | the data base is adequate proves false, the Inquiry  
29 | could recommend that the applicant undertake further  
30 | studies in order that a valid comparison of the



G.S. Davies  
In Chief

1 alternatives be made.

2 Foothills Pipe Lines Ltd.

3 should similarly evaluate the route refinements that  
4 they are currently considering. I understand that there  
5 are certain laterals that have yet to be determined  
6 as to their exact alignment. I suspect also that  
7 Foothills could consider the possibility of running  
8 a pipeline from the delta over to Prudhoe Bay, as yet  
9 another possibility in the future.

10 It will be useful for the  
11 applicants to undertake this analysis because it should  
12 minimize the number of on-the-spot tradeoff analyses  
13 during construction.

14 Q Dr. Davies, that concludes  
15 your evidence?

16 A Yes, that's correct.

17 THE COMMISSIONER: Dr. Davies,  
18 just two or three things. You said when you began your  
19 testimony today that none of the proposed routes that  
20 have been ventilated at the Inquiry appeared to you  
21 to have been developed according to any well-established  
22 methodology, and none appeared to meet a given set of  
23 criteria in the sense of standing out, in the sense of  
24 any one route standing out above all the others.  
25 You were thinking of the circum-delta route, the cross-  
26 delta route, the coastal route, the interior route, the  
27 Fairbanks route, were you thinking of all of those  
28 things or --

29 A Yes.

30





G. S. Davies  
In Chief

1                                   A     Yes I think I implied  
2 earlier in the proceedings that the alternative  
3 corridors were an important part of the analysis and  
4 I didn't think that was done adequately, but in any  
5 case, there were mitigating aspects of that particular  
6 problem, so we passed over the problems concerned with  
7 the corridors and jumped into the question of route  
8 selection within a corridor and so really now, I think  
9 what we're faced with is looking at the latter example  
10 as you mentioned; the delta crossing and perhaps at  
11 Fort Simpson, realignment in a few of these.

12                                  Q     Dr. Bliss, of the  
13 University of Alberta gave evidence in January, and he  
14 said that he and a colleague at the university had  
15 compared the coastal route across the northern Yukon  
16 with the interior route and they had scored each route  
17 on the basis of various factors, impact on vegetation,  
18 impact on the fish, impact on the caribou, impact on  
19 birds and so on and so forth. Then they had come up  
20 with a conclusion which they offered only tentatively  
21 as I recall, that the interior route <sup>was</sup> less harmful in  
22 terms of environmental impact. Now, they weren't  
23 weighing social impact and they certainly weren't weigh-  
24 ing financial or economic factors.

25                                   I don't know whether you saw  
26 that evidence.

27                                  A     No, I did not.

28                                  Q     It was given by Dr. Bliss  
29 when the Environment Protection Board returned for  
30 cross-examination in January which, I think, was the first



G. S. Davies  
In Chief

1 week in January. I think it was just before you gave  
2 evidence in January, wasn't it? At any rate, -- well,  
3 that brings me to this, if Arctic Gas and Foothills were  
4 to pursue this process that you've urged; that is that  
5 they should evaluate these alternate routes -- leave  
6 Foothills out of it for the moment because they really  
7 just have one route. But, let us say that Arctic Gas  
8 should evaluate the circum-delta and the cross-delta  
9 route on the basis of these tests that have been  
10 developed in this field.

11 Now, should they consider only  
12 environmental factors? Should they try to add in, so  
13 to speak, the social factors and should they try to add  
14 in the purely cost factors? That is, cost to them as  
15 opposed to society. You see, they say that it will cost  
16 almost \$200 million more to build this thing along the  
17 circum-delta route than across the delta. So that's  
18 a factor that if you throw it in, to your equation,  
19 more or less -- well I suppose the chances are it leads  
20 you to -- it means the result is likely to be in favor  
21 of cross-delta unless the contravailing environmental  
22 and social factors are very much greater along that route.

23 So, if you're urging <sup>them</sup> to do all  
24 this, do they weigh everything? Let us suppose we asked  
25 Dr. Fyles to do it, to leave the companies out of this  
26 for the moment, because he probably knows more about both  
27 their routes than anyone in their organizations that  
28 does. So --

29 A He's not listening either,  
30 so we can almost do anything we want.



G. S. Davies  
In Chief

1 Q So, what would he do?  
2 Would he seek to weigh environmental factors merely?  
3 Would he weigh social factors as well; financial factors  
4 as well?

5 A Well, I'm assuming that  
6 Dr. Fyles has at his disposal a number of different kinds  
7 of experts or specialists and I would think that he  
8 would try the most comprehensive approach first of all  
9 to see if the available data is malleable to it. Now,  
10 there may be limitations based upon available data, but  
11 I think he should certainly try both environmental and  
12 social -- to meet social, environmental objectives for  
13 those alternatives.

14 Then, what you get as a result  
15 of applying this, I think, is a very clear understanding  
16 of what the environmental and social costs are. Now,  
17 you can't say they're worth so many dollars, but I think  
18 you can get some appreciation of the magnitude of what  
19 they are, much more clearly than at least I currently  
20 have now from reading the prepared evidence of CAGSL.

21 It may well be at that point that society decides  
22 that that extra cost is something that will be incurred  
23 as part of the project because environmental losses and  
24 social implications of going across the delta are severe  
25 and should not be tolerated.

26 I'm not making that recommenda-  
27 tion. I'm saying if that were the outcome, then that  
28 extra so many million dollars then would be forfeited  
29 as a cost of the project.

30 THE COMMISSIONER: O.K. Cross-





G. S. Davies  
Cross-Exam by Bayly

1 examination?

2 MR. MARSHALL: I think I am  
3 entitled to the last, sir.

4 THE COMMISSIONER: All right.

5 MR. BAYLY: I suppose I'm  
6 entitled to go first.

7 CROSS-EXAMINATION BY MR. BAYLY:

8 Q Dr. Davies, referring to  
9 page three of your evidence, item five. How would you  
10 propose that the public has access to the assessment  
11 work and that if the public has comments that they are  
12 received in the various projects?

13 A I'm sorry Mr. Bayly, would  
14 you mind repeating that once more? How would I propose--

15 Q You say that E.A.P. ensures  
16 that the public has access to the E.I.S. and obtains  
17 their comments.

18 A Yes.

19 Q Now, I'm assuming that  
20 there's some method for that, that you find acceptable  
21 and gives you an accurate picture of the public's re-  
22 action.

23 A Well, of course, that's  
24 a very thorny question because it's -- you can't treat  
25 the public as one body obviously. There are many  
26 different publics and it's a question of really, I suppose,  
27 in the first instance deciding who are these publics and  
28 you can go through, you know, quite an exercise in  
29 establishing who are the primary actors in any given  
30 project and there are a number of ways of obtaining



G. S. Davies  
Cross-Exam by Bayly

1 public input; through hearings, through drop-in centers,  
2 through involving them in actual project teams as I  
3 described earlier. I think a number of government  
4 agencies have developed studies in which they try to  
5 decide what the best combination of these approaches is  
6 for any given type of project, but we're in a learning  
7 situation really and I'm really in no position to give  
8 a pat answer to that.

9 Q Well, I assume you look  
10 in the geographical region for some of those people that  
11 form the public that's interested in the decision that's  
12 going to made?

13 A Oh yes, certainly.

14 Q Then you look for some  
15 people that may have more abstract interests, say, if  
16 there's a possible disturbance to the environment, ones  
17 that are interested in preserving various things in the  
18 environment?

19 A Oh yes. I suspect that  
20 you have people who are directly affected by any project.  
21 In a project like this, you have people along the  
22 alignment who are obviously are directly affected and  
23 these are of prime concern and prime interest to a  
24 Commission like this one. Then of course, you have  
25 people who do not live here who are not directly  
26 affected but who are concerned and these would be people  
27 who don't even live in the area. People who will still,  
28 as citizens of this country for example, bear some of  
29 the costs of the project.

30 Q How do you involve them



G. S. Davies  
Cross-Exam by Bayly

1 in the sense that you may have to devise the questions  
2 in order to get the reactions of the people? Do you  
3 use that as a process to elicit the concerns of people  
4 who may not be used to articulating their concerns like  
5 consultants?

6 A Oh, I see.

7 Q What do you do?

8 A Well, in some cases we've  
9 developed drop-in centers at strategic points in a  
10 given community where we have some project at hand and  
11 we ask people to fill these in and these are carefully  
12 prepared questionnaires which will allow us to do some  
13 sort of a trend analysis based on the responses that we  
14 get. What we generally like to do, if it's possible;  
15 if our client is willing and if the situation is one  
16 of high interest by the public, is to get these inputs  
17 in the early stages of the project so they can affect  
18 design where it's possible.

19 Q I take it if you don't  
20 do that, you may find that it's harder and harder for the  
21 people who are not involved in the actual project to  
22 influence the decisions that are made about it?

23 A That's right and by  
24 getting public involvement early in a project, you tend  
25 to minimize the public complaints later on. They never  
26 disappear of course, because you can't satisfy every-  
27 body, but the point -- I suppose the essential conflict  
28 that, as<sup>a</sup> consultant, I've come to realize so often is  
29 that there is a certain need for your client to have  
30 confidentiality as he proceeds with his development plans.





G. S. Davies  
Cross-Exam by Bayly

1 By the same token, there's a certain need for the  
2 public to be aware of what the implications of his plans  
3 are for himself; the public, that is.

4 If that awareness could be  
5 made early in the game, then it's possible for the  
6 public to feed into the process, be part of the whole  
7 process and be thus -- it would just minimize as a  
8 potential for an adversary situation later on.

9 Q Do you see the public  
10 being involved in points little (i) to little (iv) on page  
11 four?

12 A Well, it's I think, a  
13 matter of record in Ontario that the public is not  
14 usually involved in evolving the guidelines for  
15 projects, although I think in the case of the guide-  
16 lines for this -- the project that we're dealing with  
17 here, the public was in fact -- or at least they had  
18 the opportunity to become involved in evolving the guide-  
19 lines. But typically, government experts will prepare  
20 the guidelines.

21 Q Would you recommend that  
22 that not be so; that it, in fact, be something that  
23 involves public consultation?

24 A Well, I think it was done  
25 in the appropriate fashion here. Yes, the public was  
26 involved. Yes. Number two, I have pointed out once  
27 again in Ontario and these points here refer to the  
28 assessment process in Ontario, the public often is  
29 involved in preparation of the impact statement, at  
30 least with respect to highway route selection because



G. S. Davies  
Cross-Exam by Bayly

1 they're often made one of the teams of people who evaluate  
2 the corridors. Well, the review of course, is carried  
3 out by the -- at the direction of the Minister and if  
4 the public in Ontario does not think the review is adequate,  
5 it can ask the Minister to then put it into a public hearing.  
6 They can initiate the request for a public hearing.

7 Q All right.

8 A It's not the responsibility  
9 of the Cabinet.

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G.S. Davies  
Cross-Exam by Bayly

1 Q So that gives the public  
2 an additional step that they can cause to be taken in  
3 an instance where they're not satisfied.

4 A That's correct.

5 Q Turning to page 5, you  
6 talk in the first full paragraph after the numbered  
7 items about what is tolerable to society, and I assume  
8 that that's a judgmental decision as to whether something  
9 is tolerable to society based on the various inputs that  
10 are received from the public, the government, and the  
11 private sector involved in the project.

12 A Yes.

13 Q Is that a decision that  
14 is generally made after the public involvement, or is  
15 it one that is usually made prior to the public  
16 involvement, that is to assess what will be tolerable  
17 to society.

18 A Well, it should come  
19 at the end of the public's involvement, I think. We  
20 all stand accused of pre-judging the way any group of  
21 people might act, however, so I think people do tend  
22 to make up their minds as to what is desirable and  
23 what isn't desirable; but if you're asking me how the  
24 process should work, then obviously I think the public  
25 involvement should be expressed and from that you could  
26 determine what in fact is a guideline to determining  
27 whether a project is tolerable or not.

28 Q Now in your experience  
29 as a consultant, have you encountered any clients who  
30 were prepared to fund environmental studies, impact





G.S. Davies  
CrossExam by Bayly

1 studies with a no project alternative?

2 A I have never talked to a  
3 client who suggested that that should be done. In fact,  
4 I think it's fair to say that in my experience as a  
5 consultant anyway we have never done a project in which  
6 that has been included.

7 Q All right, and I assume  
8 that means too that when your guidelines are drawn up,  
9 not as they were in this case, but as they are in other  
10 cases, without the involvement of the public, that if  
11 government draws them up then they have pre-supposed  
12 that the project on some basis is one which is tolerable  
13 to society.

14 A Yes, this is very often  
15 the case, I think.

16 Q Now, referring to matters  
17 on page 8 of your prepared evidence, when you're  
18 discussing the importance of the various measures, can  
19 you give us any guidance on how one decides on what  
20 is important to study and what can be ignored during  
21 environmental impact studies? Let me give you an  
22 example here that may suggest what I'm driving at.  
23 If you don't have the funds or the time to study all  
24 parts of the ecosystem, and I gather that happens on  
25 some projects, and all the species in it, how do you  
26 decide what to study? Would you for example study white-  
27 fish because they're used by man, or would you just  
28 ignore the ninespine stickleback because only loons  
29 eat them? How do you make that kind of a judgment  
30 and who makes it?



G.S. Davies  
Cross-Exam by Bayly

1                                   A     I think a judgment first  
2 of all is usually made by the team of consultants that  
3 are doing the study, and that's true because the guide-  
4 lines' <sup>often</sup> for any given project are not very well developed.  
5 Now what we're finding in Ontario is that we have a  
6 great deal of interaction with the regulatory agencies  
7 who are evolving       the guidelines and so consultants  
8 in general are probably influencing by their experience  
9 the future elaboration of these guidelines. So in  
10 consort with government the consultant as retained  
11 by the proponent, is developing what the priorities  
12 ought to be. It's a learning process, in other words,  
13 Mr. Bayly.

14                                  Q     All right. I take it that  
15 if you have a date that's put into that as well, you're  
16 faced with an additional problem, for example if you  
17 could only study say the ninespine stickleback, with  
18 ten years of research, and both industry and government  
19 felt that the project should get started within five  
20 years, that you'd either have to do a shorter study of  
21 the stickleback, or you'd have to abandon that portion  
22 of your study altogether.

23                                  A     Well, let me try and  
24 answer your question this way and see if I can get at  
25 what you're driving at. When somebody approaches us  
26 with a proposal to do a study which involves, for  
27 example,   site selection, rather than sitting down  
28 and drawing up the terms of reference for the job  
29 which involve a two-year, three-year study, whatever,  
30 normally we sit down and advise a preliminary study



G.S. Davies  
Cross-Exam by Bayly

1 to be done where we look at the scope of the problem  
2 and try to determine what the important ecological factors  
3 are, and this is a short-term project, perhaps, you know,  
4 a matter of three months, four months. In a typical  
5 instance a client might come to you and say, "I'd like  
6 to build a large industrial facility somewhere in  
7 Eastern Canada. It's got certain problems associated  
8 with it. We've done a bit of homework about where we  
9 would like to put it. We think we have maybe 15 sites  
10 that we're really interested in from a technical view,  
11 and we'd like your comments on it from the point of  
12 view of the cost involved in developing, and also the  
13 environmental implications of developing <sup>any</sup> one of them."

14 Now here you have 15 sites.  
15 Now you could start out and spend the rest of your  
16 career probably on that job if you studied all the  
17 sites in some detail; but you cannot, there are too  
18 many constraints so you take the first phase of the  
19 study, to decide what the important issues are, what  
20 components of the environment should be studied, and I  
21 think you foreshadow the way we do it, in the sense that  
22 species which we know are of importance to man for  
23 commercial reasons or recreational reasons, we always  
24 concentrate on. Certain species have an importance  
25 which can't be attached to their commercial value, and  
26 if we're aware of these species, that's a big "if",  
27 then we'll try to zero in on those in our studies.  
28 Anyway, in the first instance generally what you do  
29 is you gather the available information, you interview  
30 people and so on, to set the dimensions of the problem,





G.S. Davies  
Cross-Exam by Bayly

1 and from that you may be able to find early in the game  
2 that of these 15 or so sites, some of them are quite  
3 unsuitable, they're not up to snuff, and so after you  
4 apply some very basic kinds of criteria to measure or not  
5 whether they're up to snuff, you may eliminate a few  
6 of these and then be left with a package of 7 or 8.

7 When you've got down to that  
8 point then you ask your client for more money because  
9 you want to determine if these sites really are adequate  
10 and you want the chance to gather more data because you're  
11 usually in the situation where data is limited. So then  
12 you may have a project which runs for several months.  
13 At the end of that time you may be in a position to  
14 narrow it down to two or three sites, and at this time  
15 two things have happened, you've learned more about  
16 the sites or alignments, if <sup>it's</sup> that's kind of problem  
17 you're working with, you've learned more about the  
18 project itself and the implications of the project  
19 which we usually find are as crudely developed as our  
20 state of knowledge about the environment itself.

21 Then when you get down in the  
22 last analysis, when you have two alignments or three  
23 alignments, or two or three sites, then you're talking  
24 about perhaps a year to go through some sort of biological  
25 sequence to finally appraise these sites. So you may be  
26 talking about a two or three-year cycle.

27 Q Do you feel that in your  
28 appraisal of what Arctic Gas and Foothills did in  
29 their approach to this problem that they approximated  
30 what you've suggested as the approach?



G.S. Davies  
Cross-Exam by Bayly

1                   A     Well, I think as I've  
2     said all along, my feeling or my understanding is that  
3     the question of corridors has been something that's not  
4     been treated very seriously and as I said, there's a  
5     number of reasons for that, I guess, from what I can glean  
6     out of the transcripts.     So you know, from the point  
7     of view of an environmentalist I think, you know, I'm  
8     not at all convinced, for example, we're even in the  
9     right corridor. However, we are in this corridor, and then  
10    we're faced with the problem of what alignment within the  
11    corridor. Now, I think my general impression is that  
12    Arctic Gas has gathered a tremendous amount of informa-  
13    tion but I'm not sure that it's been gathered in the  
14    way that I described earlier to -- I'm not sure what  
15    their objectives were in gathering information. There  
16    are great holes, as one can see in the available  
17    information. A lot of attention was paid to gathering  
18    baseline data, in other words just what's there. Not  
19    very much attention seemed to be placed on looking at  
20    processes, for example although there was, as I under-  
21    stand it, there's a test loop at Sans Sault, was there  
22    a river crossing involved in that?     In that test loop,  
23    I think not.     The impact of constructing a river  
24    crossing on a test loop, although perhaps expensive,  
25    may have provided a lot of answers for some of the  
26    problems that we're facing today, and lest anybody should  
27    object that that is expensive, I guess I would be  
28    from Missouri and say I'd like to see what it really  
29    would cost because we're spending a lot of dollars  
30    right now arguing about it.



C.S. Davies  
Cross-Exam by Bayly

1                                    You know, what is the impact  
2 of increase siltation on fishes? What are the siltation  
3 tolerance<sup>levels</sup> of northern species? Are the good engineering  
4 practices that we hear about so often effective? It  
5 seems to me that some of the studies could have been,  
6 you know, been towards answering questions like that.

7                                    Q     So you're saying really  
8 that the baseline information, although voluminous and  
9 in some ways very helpful, doesn't help us to predict  
10 impacts?

11                                  A     No, not at all.     There  
12 are two aspects here, and you need both.

13                                  Q     And we've only got the  
14 one in most instances.

15                                  A     I think so.

16                                  Q     Now, on page 15 at the  
17 beginning of the preference curves that you were  
18 discussing today in your evidence, and I gather that  
19 you are -- you feel in this kind of an approach that  
20 you can equate dollar costs with something like family  
21 displacement.     In fact you have to if you use this  
22 approach.

23                                  A     There is a dollars cost  
24 involved, yes.

25                                  Q     I can see that. The  
26 dollars cost is the same kind of thing you face in the  
27 St. Lawrence Seaway where you move the houses or where  
28 you set up a new community. Those you can equate  
29 dollar costs versus dollar costs.

30                                  A     Yes.





G.S. Davies  
Cross-Exam by Bayly

1 Q What you can't equate in  
2 family displacement, I suggest to you , is the value  
3 placed on community, on site, on familiarity, on owner-  
4 ship of land or whatever.

5 A You can't put a dollars  
6 cost on a disruption.

7 Q Right.

8 A That is placed to the  
9 community or the individual family, no.

10 Q And you can't put a dollars  
11 cost on the loss of something that can't be regained after  
12 the project is over, I presume. That is, let's  
13 assume it's for an animal, this time, the loss of  
14 habitat to certain populations.



1 A Well, there are many  
2 ways of putting dollars costs in and most of them are  
3 indirect, you know, in terms of loss of hunting if it's  
4 a commercial species and so on, but I think if you're  
5 -- no, there are certain intangible values that it's  
6 not appropriate to try and cost.

7 Q They're all people costs  
8 that you put on these diagrams. Isn't that right? The  
9 cost to people rather than, to say species?

10 A That's true.

11 Q So that --

12 A I was being selective.

13 Q Yes. We were told by  
14 Dr. McTaggart-Cowan that if something was done to  
15 disrupt the Porcupine caribou herd, as a herd of that  
16 magnitude, there's nowhere else they can go. So, once  
17 you've disrupted that, you've actually lost something.  
18 Or they've lost something.

19 A Yes, that's correct.

20 Q That doesn't fit into  
21 this kind of a --

22 A No. That would be a  
23 judgmental decision where you'd listen to specialists,  
24 as would, I think, for example, the case of the white  
25 whales in the cross-delta.

26 Q Even in terms of dis-  
27 placing families, you're looking only at the quantitative  
28 displacement. That is, it's better to displace two or  
29 three families than it is to displace five?

30 A Yes. As I said, in this



G. S. Davies  
Cross-Exam by Bayly

1 approach, you're looking at things that can be  
2 measured so that at least for part of your decision, you  
3 can anchor yourself to something, O.K. But then, beyond  
4 that, you do have to contend with intangibles and all  
5 we're really <sup>trying</sup> to accomplish here is to reduce the  
6 number of intangibles, if possible.

7 Q To deduce them, or reduce  
8 them, I'm sorry?

9 A Reduce them.

10 Q Reduce them, yes. So,  
11 you feel that this -- but this won't help you to find  
12 out what they are. This will only identify and allow  
13 you to equate the ones that can be measured?

14 A That's correct.

15 Q You've got to back to your  
16 community workshop, drop-in center --

17 A Yes.

18 Q -- survey approach to --

19 A That's correct, yes.

20 Q -- look at the intangibles.

21 In some projects, I suggest that there's a tendency to  
22 ignore them because they can't be measured.

23 A Oh yes, this is so. I  
24 think the thrust of my evidence is that there are  
25 many things that can be measured that are being ignored.

26 Q Right.

27 A I certainly concede your  
28 point, however.

29 Q Right. We'd be in the  
30 position of Mr. Dau when he says: "I can't put a price





G. S. Davies  
Cross-Exam by Bayly

1 on a peregrine falcon.

2 A That's right.

3 Q He means, he can't fit it  
4 into something like this diagram.

5 A Yes.

6 Q Turning to this curve on  
7 page 16, I gather it's the second curve that you might  
8 be able to use to help a community to reach some sort of  
9 a compromise between what they want and between what  
10 the proponents of a project are trying to do.

11 A Well the second curve if  
12 you're referring to the figure at the bottom on disagree-  
13 ment on preferences -- is that the one?

14 Q Yes.

15 A Yes. It evolves from  
16 your participation with the community really and just  
17 identifies for you that the preferences are -- that the  
18 public is not homogeneous.

19 Q All right.

20 A So it sets up a situation  
21 where you are going to have <sup>to</sup> make a politically based  
22 trade-off or you are going to have to further study the  
23 problem to see if the disagreement can be resolved some-  
24 how.

25 Q Right. So, really the  
26 first curve depends on people who are -- who have  
27 the same priorities.

28 A That's correct.

29 Q The second, the disagree-  
30 ment on preference one is the more usual one, I suggest



G. S. Davies  
Cross-Exam by Bayly

1 when you're dealing with people who are looking at  
2 something through different ends of the telescope.

3 A That's right.

4 Q Now, one thing I'm con-  
5 cerned with is on page 18, the last two lines. You talk  
6 about on the spot trade-off analyses during the const-  
7 ruction, and I assume that you contemplate that whatever  
8 we do, we're going to end up with some of these, with  
9 the project manager deciding whether to go across that  
10 trapline or not?

11 A Yes. That's right. Well,  
12 I gather from looking at a number of the witnesses'  
13 evidence that we have -- this can be appreciated in in-  
14 complete data-base and that only a certain proportion  
15 of the river crossings have been examined in any detail  
16 at all, so some of them will be virginal I suppose by  
17 the time you get there, in the sense of our knowledge and  
18 it may be that there is some possibility for minor  
19 route alignments and there could be a decision situation.

20 Q But these on the spot  
21 analyses, very likely will not be conducted with one  
22 of your graphs?

23 A Not at all.

24 Q It will be the trapper  
25 coming up and discussing with the project manager and  
26 hoping that something can be done, if we can use that  
27 as an example or vice versa?

28 A Or the environmental  
29 inspector that's been assigned. Yes, that's possible.  
30 That the thrust of using an approach like this, though



G. S. Davies  
Cross-Exam by Bayly

1 is to reduce the number of those kinds of decisions that  
2 have to be made.

3 Q Right, so we take a  
4 project that costs only -- let's just say roughly \$2  
5 million a day and if we had one of these on the spot  
6 consultations, the dollar costs on your graph is way  
7 up high and the displacement of, in this case, the --  
8 or going over the trapline, looks pretty small on the  
9 horizontal part of the -- horizontal axis of the  
10 diagram?

11 A Yes, I suspect that some  
12 of the gentlemen you've had here from Alaska are in a  
13 much better position to tell you how their recommenda-  
14 tions are carried out on the job than I would be, and  
15 perhaps some of the people in the management panel which  
16 are -- management panels to follow will be in a better  
17 position to tell me about the efficacy of implementing  
18 some of these recommended procedures on the spot.

19 Q Now, a great deal has been  
20 left in this proposed project of what is popularly called  
21 "final design". Do you see this as a tool for those  
22 people who are making <sup>up</sup> final design in that the input of  
23 the public is to be now, prior to that?

24 A Well, you say, "to use  
25 this", are you talking about route selection procedures?

26 Q Yes. We've been told, for  
27 example that the river crossing site at a certain river,  
28 can't be determined now. That's a matter for final  
29 design. Final design may affect people who use the  
30 river, but their chance to make an input is now. They





G. S. Davies  
Cross-Exam by Bayly

1 look at the route as it is now put on the map. Perhaps  
2 the crossing will be where it is presently suggested.  
3 Perhaps it will be elsewhere. In other words, the  
4 input of the public appears to be at a stage prior to  
5 selection of the route within the corridor.

6 A This is a very large  
7 problem, of course, referring to the projects that we're  
8 considering here. Generally speaking, at this point, I  
9 think, you would be coming to the public with a fairly  
10 clear idea of what your final choices are and what  
11 you understand about them so that you could get a help-  
12 ful input from them. I'm not so certain we do have  
13 that clear kind of knowledge of what the implications  
14 are of going to either one of these alternatives or any  
15 one of the several alternatives. I guess I'm suggesting  
16 really, that if it's just a case of presentation, then  
17 if the data is there then I think Canadian Arctic Gas  
18 should make a clear presentation so that it could be  
19 evaluated -- the various alternatives could be evaluated  
20 more easily by the public.

21 Rightnow, it's very unclear  
22 to me that this is the case.

23 Q Now, I gather that what  
24 you are suggesting be done as a method is a method which  
25 is used in business usually under the heading of  
26 operations research or decision science. Would you  
27 agree with that?

28 A To a certain extent, yes.  
29 That's right.

30 Q What you're proposing is



G. S. Davies  
Cross-Exam by Bayly

1 perhaps a decision science approach to the environ-  
2 mental trade-off problem in as far as that can be done?

3 A Yes.

4 Q What you're telling us  
5 is that at least this gives us a method even if it  
6 isn't totally satisfactory at measuring some things  
7 which different groups will be measuring differently  
8 anyway.

9 A Yes. It gives us a  
10 method for -- well, it's almost <sup>like</sup> a framework for approach-  
11 ing a problem really. Inherent in there are a lot of  
12 questions, really, to the applicants. Like, what were  
13 your environmental objectives? How have you met them?  
14 What are the data that you were using to evaluate the  
15 degree of objective attainment? How did you rate the  
16 alternatives? In the case of individual issues, yes,  
17 trying to apply some sort of operations research approach  
18 is fine as far as it goes. But, I think at the level  
19 of evaluating the total ability of any one route to  
20 meet your objectives, that's the one where these approaches  
21 could be vastly improved.

22 Q All right. Now, we've  
23 heard evidence on the technical side from both appli-  
24 cants that this technique may have already been used  
25 by them in choosing certain things; in choosing pipe  
26 size, and compressor station size, looking at the  
27 economies of scale. If they didn't use this exact  
28 technique, it appears that they used one similar.

29 A Yes, this is standard  
30 engineering practice, I believe.



G. S. Davies  
Cross-Exam by Bayly

1 Q Yes. Compressor station  
2 spacing may well have been chosen on the basis of looking  
3 at graphs of this sort.

4 A Yes.

5 Q And possibly, the decision  
6 to go across the delta in<sup>a</sup> sense may have been done by  
7 weighing off dollar costs on one side of the graph with  
8 possible environmental costs on the other?

9 A This would seem to be the  
10 case, yes.

11 Q What you'd be concerned  
12 about with that particular or that last example, is that  
13 it may be difficult to do that using only baseline  
14 data as your environmental knowledge.

15 A Yes, without an under-  
16 standing -- a better understanding of what the impacts  
17 are, what the processes are that will be put into  
18 effect by the construction activities, by the operational  
19 activities, then I think you're operating in the dark.

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G.S. Davies  
Cross-Exam by Bayly

1 Q And it appears that --

2 A I'm sorry, Mr. Bayly, I  
3 suppose one way of trying to answer that is to say that  
4 I suspect that it may have been possible for a group of  
5 well-qualified consultants to sit down and write the  
6 entire report without doing any studies at all, and have  
7 been able to predict as far as they have predicted right  
8 now, what the impacts will be. Not site specific, but  
9 the nature of the impact; so that now that the report  
10 has been completed, you know, given this situation, I  
11 don't think there are any surprising impacts. We know  
12 more about the sites but I don't know any more about  
13 the nature or magnitude of impacts than when we began,  
14 perhaps, with a few exceptions. It's one measure as  
15 a consultant, I think, when you do a study that once  
16 you've done one or two studies on a certain type of  
17 project, if when you complete the study you haven't  
18 improved the state of knowledge about the types of impacts  
19 that are caused by that project, then what in fact have  
20 you done? You've just described the existing environ-  
21 ments and not much more.

22 Q And I take it that if  
23 we go one step further into the phase 4 concerns, that  
24 we may have even less from the applicants.

25 A Say that again.

26 Q For example, we are told  
27 that pipelines will be placed an appropriate distance  
28 from communities and we have heard that it was Mr.  
29 Dau, an engineer, who decided what was appropriate.

30 A I can't confirm that that



G.S. Davies  
Cross-Exam by Bayly

1 was the case, but I suspect that what I fear is that  
2 the environmental input has always been -- and this may  
3 also apply to the social input into this problem --  
4 after the fact. In other words, the environmental and  
5 social experts have apparently played a reactive  
6 role. Engineers have selected a route, what do you think  
7 of it? That's not a bad approach in some ways, but I  
8 think a better approach is engineers, social-scientists,  
9 what have you, the public, sit down jointly and I think  
10 that's not an imaginary position, it's something that's  
11 been done in other projects. It does in fact not always  
12 cost more money. It sometimes costs less money.

13 MR. BAYLY: Those are all the  
14 questions I have. Thank you very much, sir.

15 MR. GOUDGE: Mr. Commissioner,  
16 would this be an appropriate time to break for coffee?

17 THE COMMISSIONER: All right.  
18 I'm in a position to rule on Mr. Marshall's objection  
19 to the evidence Mr. Bayly proposes to adduce.

20 Mr. Bayly, on behalf of COPE,  
21 proposes to introduce evidence of a major oil spill in  
22 Japan. He says it will offer the Inquiry evidence that  
23 will be useful in determining the impact of an oil  
24 spill in the Mackenzie Delta or the Beaufort Sea, and  
25 evidence that will be useful in assessing the industry's  
26 present capacity to clean up an oil spill.

27 Now we are looking at a gas  
28 pipeline but we have been told by the government to  
29 proceed on the assumption that it will be followed by  
30 an oil pipeline. So we have all along been seeking



G.S. Davies

1 to establish what the impact would be of a pipeline  
2 corridor with gas and oil pipelines. We have been told  
3 that gas and oil pipelines from the Arctic to the south  
4 would lead to a proliferation of oil and gas exploration  
5 and development in the Beaufort Sea. I am not talking  
6 now about the two wells that Dome proposes to drill this  
7 summer. The government has not asked the Inquiry to  
8 assess the risk of drilling those wells or the consequences  
9 of a spill if there were a blowout at one of those  
10 wells. But the Inquiry is concerned about the long-term  
11 risk of many, many wells being drilled in the deep  
12 water of the Beaufort Sea over a period of years.

13 So we are vitally concerned  
14 about the consequences of a major oil spill in Canadian  
15 Arctic waters. But Arctic Gas and Foothills say, "what  
16 has a spill in the Sea of Japan got to do with the Canad-  
17 ian Arctic? What can we learn from a spill of bunker  
18 oil resulting from the rupture of oil tanks and the  
19 breaching of a dyke in a harbor in Japan?"

20 Now you can get an oil spill  
21 from any number of causes. For instance, Imperial Oil  
22 has told the Inquiry that a storm in the Beaufort Sea  
23 last year sheared of the corner of an artificial island  
24 in the Beaufort Sea, 70,000 gallons of oil had to be  
25 removed from exposed tanks to prevent a spill. If the  
26 oil had not been removed, if it had not been possible  
27 to remove the oil in time there would have been a spill,  
28 not of the magnitude of the "Mizushima" spill but a  
29 spill similar in its cause and in a limited sense no  
30 doubt in its effect.





G.S. Davies

1                               Spills can occur if a tanker  
2 goes down and Foothills Pipe Lines has already told us  
3 that it is considering bringing a tanker with 35,000  
4 tons of fuel oil into the Beaufort Sea to Tuktoyaktuk.

5                               Now it would be helpful in  
6 a scientific sense but disastrous in all other respects  
7 if a major oil spill had already occurred in the  
8 Canadian Arctic. We would then have a good idea what  
9 its impact would be, and a good idea of the possibilities  
10 of cleaning it up . But there hasn't been one because  
11 we haven't started drilling yet, not at least in the  
12 Beaufort Sea. Mr. Nichol was sent by the Government of  
13 Canada to Japan to see what he could find out when  
14 the "Mizushima" oil spill occurred, to see what he  
15 could find out about its consequences and about the  
16 capacity of -- that the Japanese had to clean it up.  
17 I think that we should hear what he has learned from  
18 the Japanese. I think it will be useful to us in deter-  
19 mining what the impact of a spill is likely to be in the  
20 Canadian Arctic and in determining what the present  
21 capacity of the industry is to clean up a major oil  
22 spill in the Arctic. It is, granted, evidence that  
23 would not be as useful as evidence by an eye witness  
24 to a major oil spill in Arctic waters. I can only say  
25 that our whole object is to make sure that such an  
26 event doesn't occur and if we are to take measures to  
27 see that a spill in Arctic waters doesn't occur, then  
28 we have to find out what the impact has been of spills  
29 in temperate waters and of the success of cleanup  
30 measures taken in temperate waters. So we'll allow



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1 this evidence in, and we'll adjourn for coffee.

2 (PROCEEDINGS ADJOURNED FOR A FEW MINUTES)

3 (PROCEEDINGS RESUMED PURSUANT TO ADJOURNMENT)

4 MR. GOUDGE: Before we continue  
5 the cross-examination of Dr. Davies, I have in hand a  
6 document that's been recently published by the Depart-  
7 ment of Indian & Northern Affairs entitled:

8 "North of 60, Mackenzie Valley Pipeline Inquiry,  
9 Summary of Proceedings, Volume 1, Construction  
10 and Engineering,"

11 which I think perhaps we ought to file as it has been  
12 prepared by someone well-known to all of us, and con-  
13 tains summaries of the proceedings of this Inquiry up  
14 until November, and one will find in it, if one can  
15 read the print, which is almost infinitesimal in size,  
16 the summary in 250 pages of about 11,000 pages of  
17 transcript. So I'd like to file it, sir, and Mr. Gamble  
18 has advised me that he's made arrangements to have a  
19 table in the lobby with a number of copies there and  
20 he'll be signing at the end of the day.

21 THE COMMISSIONER: Well, good.

22 MR. HOLLINGWORTH: Well, perhaps  
23 Commission counsel could advise whether copies will be  
24 made available to all participants?

25 MR. GOUDGE: The author indi-  
26 cated he had one or two extra copies and I'm sure could  
27 make arrangements for others if the participants wish.  
28 They're a very useful document.

29 THE COMMISSIONER: I think  
30 we'll prevail on Mr. Gamble to use his good offices in



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Cross-Exam by Hollingworth

1 Ottawa to make sure all participants have a copy. I'm  
2 sure it will be useful. They're going fast but I  
3 think he could probably --

4 MR. HOLLINGWORTH: It's into the  
5 second printing, I understand.

6 MR. MARSHALL: Mr. Gamble, on  
7 just for clarification  
8 this document, /I'm not too good at these engineering  
9 things, I was wondering on this fold-out chart of the  
10 organization whether the dotted line from the box headed  
11 "Community Hearings Co-Ordinator" that  
12 goes down to Commission counsel; I wanted to know which  
13 way the arrow went in terms of reporting authority.

14 MR. GOUDGE: If there is any  
15 line at all, over to Arctic Gas.

16 THE COMMISSIONER: Well, I  
17 think we will all obtain many hours of pleasure and  
18 edification from this document. Maybe we should move  
19 on now.

20 (NORTH OF 60 VOL. I SUMMARY OF PROCEEDINGS  
21 OF M.V.P.I. MARKED EXHIBIT 530)

22 THE COMMISSIONER: Are there  
23 any questions for Dr. Davies? Mr. Bell, I don't think has  
24 any.

25 MR. HOLLINGWORTH: I have a few,  
26 sir.

27 CROSS-EXAMINATION BY MR. HOLLINGWORTH:

28 Q Dr. Davies, have you ever  
29 been involved in the environmental assessment of a project  
30 of magnitude and aerial extent such as the proposed





G.S. Davies  
Cross-Exam by Hollingworth

1 Mackenzie Valley Pipeline, whether it be the project  
2 envisaged by Canadian Arctic Gas or that envisaged by  
3 Foothills?

4 A No, I have not.

5 Q And particularly having  
6 regard to the length of the planning process which goes  
7 back to the late '60's, you've never been involved with  
8 a project that had that kind of planning?

9 A No.

10 Q Or with the types of  
11 planning considerations, I'm speaking particularly of  
12 logistics, the sparsely populated large area, have you  
13 ever dealt with a project over an area like that?

14 A I've dealt with problems  
15 in Northern Ontario which are also equally uninhabited,  
16 if you like.

17 Q Is that the Lively to  
18 Whitefish section of Highway 17 that you refer to?

19 A No, I wasn't involved in that  
20 particular study, but I was involved in other studies  
21 in Northern Ontario.

22 Q Which studies were they,  
23 sir?

24 A Well, we're in the pre  
25 stage of a mining study, for example, which I am not  
26 free to give the details of, which is in Northern  
27 Ontario, south of James Bay, for example.

28 Q I'm sorry, I couldn't hear  
29 you through--

30 A I'm not free to name any



G.S. Davies  
Cross-Exam by Hollingworth

1 geographic areas or clients, but we're currently working  
2 on projects which have a fairly long time horizon which  
3 are involved with the impacts of various kinds of  
4 mining operations in remote areas in Northern Ontario.

5 Q But this wouldn't be a  
6 project that was linear in nature.

7 A No, the linear projects  
8 I've been involved on are concerned with transmission  
9 lines, or highways, and they are usually of a much  
10 smaller reach, if you like, than the proposed pipeline.

11 Q Were they all in Southern  
12 Ontario?

13 A No, Manitoba and Southern  
14 Ontario.

15 Q Southern Manitoba or  
16 Northern Manitoba?

17 A Southern Manitoba.

18 Q And what was the longest  
19 length of any of these projects?

20 A 25-30 miles.

21 Q And have you ever dealt  
22 with an area in the north that has to take into account  
23 permafrost conditions?

24 A No, I've never tried to  
25 suggest at any point in the proceedings that I know any-  
26 thing about northern problems.

27 Q And it follows then that  
28 you know very little if anything about the activities  
29 that will be carried out in a severe winter climate?

30 A Pardon me?



G.S. Davies  
Cross-Exam by Hollingworth

1 Q It follows that you know  
2 very little, if anything, about the activities that  
3 would have to be carried out in a severe winter climate  
4 if construction proceeded on a pipeline of this magnitude.

5 A I probably have an  
6 informed layman's ideas of those, yes.

7 Q Have you ever dealt with  
8 a project, sir, that would involve as many people on  
9 construction and as much machinery?

10 A No. I think it's fair  
11 to say, Mr. Hollingworth, that it's the largest project  
12 of its kind in Canada, so if you continue your line of  
13 questioning I'll have to answer "No" to all of them.

14 MR. MARSHALL: That was the idea.

15 A I realize that but I'd  
16 like to cut it a little shorter maybe.

MR. HOLLINGWORTH:

17 Q I'd reached the end of  
18 my list so it's just as well. Now at page 7 of your  
19 evidence, sir, you talk about a comprehensive set of  
20 experiments which could have been done at reasonable  
21 cost would have provided answers to these questions.  
22 Now perhaps you could describe in a little more detail  
23 what experiments you have in mind there.

24 A Just one minute, Mr.  
25 Hollingworth. I'm trying to find the line. Well, for  
26 example, it's possible that those field experiments and  
27 laboratory experiments to test the impacts of increasing  
28 siltation or sedimentation, if you like, on fish, these  
29 can be done in field laboratories set up near the site.  
30 You can get specific feed-back as to impact of increasing





G.S. Davies  
Cross-Exam by Hollingworth

1 silt load on fish survival, on fish performance. I'm not  
2 aware that these were in fact done. I believe people  
3 from Foothills suggested sometime during December when I  
4 was here that these were planned for the future, but they  
5 were rather vague as to the exact nature of these  
6 experiments at the time.

7 Q Well, I'm just wondering  
8 what nature you would envisage of the type of experiment  
9 that you're promoting now?

10 A Well, that was one  
11 example I just gave you, the impact of silt on fish  
12 survival, fish respiration, fish breeding.

13 Q Yes, but how would you  
14 carry that out, sir?

15 A Well, you would have  
16 holding tanks for fish, into which you'd introduce, for  
17 example, varying amounts of silt, which you would keep  
18 in suspension. This would be somewhat analogous to  
19 the situation which would be caused, for example, during  
20 a river crossing where you stir up a lot of sediment  
21 in the water. Over an appropriate time period you  
22 would have to measure the impact of causing this kind  
23 of disturbance, for example, on the survival of young  
24 of the species or upon the survival of eggs of a species,  
25 or upon the respiratory rates of the adults, and these  
26 are all things that could be measured and can be  
27 appraised as to their effect. Another kind of experi-  
28 ment I think would deal with the engineering controls  
29 that could be devised to minimize these kinds of dis-  
30 turbances. I think I've said it before but I'll say



G.S. Davies  
Cross-Exam by Hollingworth

1 it again, that one constantly reads that good engineer-  
2 ing practice will minimize this kind of disturbance.  
3 Well, what are these practices, and further having  
4 named them, have they been tried? What do siltation  
5 ponds do? How effective are they? Do they have to be  
6 linked in series? Do they have to be of any specific  
7 size? Has somebody tried creating a disturbance across  
8 a river?

9 Q Well, let's just go back  
10 a minute if we can, to your fish and the effects of  
11 siltation experiment. What do you regard as the  
12 appropriate time period that you mentioned earlier in  
13 your response?

14 A Well, I would have to go  
15 to hydrologists and find out how much disruption do  
16 they envisage, when is it envisaged, when will it occur,  
17 for how long will the sediment levels be high, what are  
18 the background sediment levels of the river? That is  
19 very important to know in the first instance, and what  
20 are the background sediment levels at that time of the  
21 year when the disturbance takes place? So I hope to  
22 get these kinds of answers from people like hydrologists  
23 or river crossing experts, whoever they might be.

24 Q All right, and how many  
25 fish would you require to experiment with?

26 A Well, the first answer to  
27 that would be to determine what species you'd want to  
28 use.

29 Q I'm assuming you would  
30 be dealing with species that would be affected in that



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1 particular reach of water.

2 A But you might not want to  
3 test every species simply because of cost. You may want  
4 to just test the species which have some commercial or  
5 potential recreational importance.

6 Q Well --

7 A And having decided that,  
8 then I think the numbers of individuals -- I'd hate to  
9 give you an answer I could be pinned down on just on the  
10 spur of the moment, but you'd want some statistically  
11 large sample. I suspect 50 individuals, perhaps, that  
12 you could work with, so that you could get some estimate  
13 of the variation in response by individuals. In addition  
14 -- well, let me take that number back. The question  
15 is popped a little too soon because there are a number  
16 of things that have to be considered. You might want  
17 to look at the impact on various age classes because we  
18 know for example that the young will behave differently  
19 than the adults, and so you may want to have , well,  
20 just off the top, 50 individuals of every age class.  
21 So that might increase the number of total individuals  
22 for that kind of experimentation.

23 Q Well, going back a minute,  
24 you said you wanted to know what the normal siltation  
25 in a particular river would be. I take it that you are  
26 aware that slumping is not an unusual phenomena on  
27 rivers in the Northwest Territories.

28 A That's right.

29 Q And so you can get a  
30 marked increase in the amount of soil and water over





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1 a short period of time, or even a fairly long period of  
2 time, it then declines.

3 A Yes, I'm aware of that,  
4 that's right.

5 Q Well --

6 A I guess what you're  
7 driving at is, so that the fish populations, if we  
8 stick with them, are used to this, is this what you're  
9 suggesting?

10 Q Well no , I hadn't  
11 finished my question.

12 A Yes , what is your  
13 question?

14 Q You said that you wanted  
15 to know what the normal siltation of the river would  
16 be. Well, I'm suggesting to you, sir, that the normal  
17 siltation of that river can vary up and down over a  
18 space of time and you'd need a long period of time in  
19 which to come up with that sort of information, wouldn't  
20 you?

21 A I'm not the right person  
22 to ask that question to, I don't think.

23 Q Well, I suggest to you, sir,  
24 that when you say it could be done at reasonable costs  
25 there are so many factors which would have to be taken  
26 into account that perhaps it wouldn't be a reasonable  
27 cost at all.

28 A Well, Mr. Hollingworth.  
29 I've heard for example that \$12 million have been  
30 spent by I believe Canadian Arctic Gas doing environmental



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1 studies. I think that's a reasonable figure, and what  
2 I'm suggesting or what I have suggested is that I think  
3 it may not be appropriate now, but I think one has to  
4 look very carefully at the way one spends one's dollars,  
5 and to the point I'm trying to make is that to spend it  
6 all on collecting baseline data or the major portion of  
7 spending baseline data may not be a very good thing, and  
8 a certain amount of it should be spent on certain kinds  
9 of experiments. Now you have me in a position where I  
10 you know, have not been faced with this problem to try  
11 to make these allocations, but I'm wondering whether  
12 anybody ever did face them as problems and come up with  
13 costs on them, did try to design experiments to see if  
14 they were feasible and what they would cost.

15 So I was really asking the  
16 question myself.



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1 Q I would suggest that you  
2 were sir, because you're really not aware of all the  
3 factors that would go into making up a cost, so you don't  
4 know whether it will be reasonable or not.

5 A Well, I'm aware  
6 of the factors that go into costing studies, I believe,  
7 but I'm not aware of the ones that went into these  
8 particular studies, no. Or in fact, what planning was  
9 involved. What doesn't come through, I suppose, is  
10 a great deal of experimental work in the presentations  
11 of the two companies and I think that's what one is  
12 entitled to question.

13 Q All right sir. Well,  
14 going on further with these suggested experiments of  
15 yours, is it your conclusion that lacking public  
16 knowledge -- publically published knowledge in the  
17 areas that we're dealing with, should the entire onus  
18 for any research studies be on <sup>the</sup> proponents of a scheme?

19 A No, and in this case,  
20 I really don't think the entire onus has been on the  
21 proponent because evidence has been entertained from  
22 the Canadian Government Social Environmental Program  
23 which has been used to support or in other ways, the  
24 positions that the various applicants have taken, I  
25 believe. So, as I'm aware, there was a great deal of  
26 information exchanged of certain points in the pro-  
27 ceedings.

28 Q I'm not arguing that  
29 point with you sir. I'm just wondering what your  
30 philosophy is, as to whether the entire onus for such





G. S. Davies  
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1 research should be on a proponent or whether it should,  
2 in fact be shared with government?

3 A Well, I'll answer that  
4 question by saying that in the Canadian north where we  
5 have a fairly low information base, that there should  
6 be some division of labor or some division of responsi-  
7 bility in that respect. In the better studied portions  
8 of the country, I think if a proponent comes along,  
9 you can expect, if not the entire onus to be on a pro-  
10 ponent, certainly a much larger proportion of the  
11 responsibility for generating data than you would in  
12 the north.

13 Q I see. In your experience  
14 what is the degree to which the laboratory study  
15 conclusions can be applied to a field situation?

16 A Well, in the first in-  
17 stance, I think when ecologists discovered white coats  
18 in laboratories was, you know, in 1950, their experiments  
19 were rather unreal in the sense that they didn't make  
20 too many efforts to mimic real-life situations. I  
21 think their perception of what is real and what is  
22 unreal has improved over the last 20 years, and so I  
23 don't think they'd be likely to repeat those mistakes.

24 One has to accept experimental  
25 work with a certain amount of hedging.

26 Q Can you place a figure  
27 on how well lab studies can duplicate a dynamic field  
28 condition?

29 A No, you have to be more  
30 specific than that for me to say that.



G. S. Davies  
Cross-Exam by Hollingworth

1 Q Well, let's take a  
2 stream or an associated basin over the course of a year  
3 or more. How closely could you duplicate that in a  
4 lab situation? Do you still need more specifics?

5 A Not very much. Not very  
6 well, but you could for example certainly duplicate  
7 the silt conditions. You could duplicate temperature  
8 conditions if these were the key. See, what you'll  
9 do, I think, is you'll select key factors that are  
10 important. You're not going to study every variable  
11 and for those important factors -- that when I say  
12 important factors, I'm thinking of factors that are  
13 important for survival of the species that you're  
14 interested in. Now, you may be only talking about four  
15 or five important ones, but if you can attempt to mock  
16 up a situation that imitates those, then the answers  
17 you get may be rough guidelines as to what you might  
18 predict in a field situation.

19 Now, the second<sup>half</sup> of the answer  
20 to your question, I think, is that you have to of  
21 course follow through with some monitoring studies  
22 after the implementation of a project. We have no  
23 precedent for this or at least, I should -- we are  
24 starting to get feedback I guess, now from the Alyeska  
25 situation which should improve to a certain extent our  
26 predictive capabilities.

27 Q I believe you've discussed  
28 the need for a consideration of alternatives, such as  
29 possibly gas transmission by L & G tank trains or  
30 something of that nature. A discussion of alternative



G. S. Davies  
Cross-Exam by Hollingworth

1 modes of transportation. Did I understand you to say  
2 that you felt there should be more discussion on this  
3 point from the applicants?

4 A You must have been at a  
5 cocktail party I was at, because I've certainly never  
6 been quoted in this Inquiry to that, I don't think.  
7 I can't lie that I haven't said it to friends.

8 Q I may well have been at  
9 the cocktail party you were at sir, but --

10 A Would you like to further  
11 that question there?

12 Q I beg your pardon?

13 A Was there a question  
14 beyond that that I missed?

15 Q No, there wasn't.

16 Page eight of your evidence, you talk about the measures  
17 to minimize environmental disruption at the top of the  
18 page and under subparagraph C, you talk about the  
19 ongoing monitoring or surveillance programs carried out  
20 during the construction and operation of the project.  
21 Sir, how can these in themselves minimize damage?

22 A Well, for one thing, by  
23 spotting defects in the system.

24 Q Could you expand on that  
25 a little?

26 A Well, let's assume you  
27 have a completed pipeline which is shipping gas. If  
28 you don't watch it and it has a leak, and you don't  
29 discover the leak for some time, then obviously there's  
30 going to be a reasonable amount of damage done. So, you





G. S. Davies  
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1 have to have, you know, a system which can give you an  
2 early warning as to a malfunction.

3 Q So you're speaking really  
4 of an engineering monitoring system?

5 A No, I'm speaking of both,  
6 but that was one example. Yes. But, during construc-  
7 tion,-- to give you another example, then during  
8 construction of the pipeline, I think you're going to  
9 require some sort of environmental inspectors, for  
10 example. These may be hired by the proponent, for  
11 example. I think that the distinction that I have,  
12 I don't know if it's shared by everybody; but monitoring  
13 is done primarily by the company and surveillance is  
14 done by the regulatory agency. The company will want  
15 to monitor and the regulatory agency will want to keep  
16 the progress under surveillance at any rate.

17 As you're building a pipeline,  
18 you will get into situations that you weren't aware of.  
19 Like coming across a nesting pair of peregrine falcons,  
20 as has been suggested as a problem.

21 Q Well, really sir, I  
22 suggest that monitoring surveillance is a sort of  
23 an early warning system to carry out the minimization  
24 features contained in subparagraph B of your evidence.  
25 It's a small point, but in themselves I suggest that  
26 monitoring and surveillance don't do anything to minimize  
27 environmental concerns. All they do is provide you  
28 with an early warning in order to carry out other  
29 measures that will minimize them.

30 A Yes, all right. I give



G. S. Davies  
Cross-Exam by Hollingworth

1 you that.

2 Q So really, what you  
3 get in to is a reaction plan and a contingency plan?

4 A Yes, that's correct.

5 Q I would suggest that  
6 that would more properly be your subparagraph C there.

7 A Yes, I think I would go  
8 along with that. I was implicit in what I was saying,  
9 but not very clear, yes.

10 Q Now, on pages nine and  
11 ten, you talk about the selection of corridors and  
12 routes and I assume that you're adopting the wording  
13 that we've used throughout the Inquiry and that is to  
14 say, a corridor is a broad band in which several routes  
15 could be found?

16 A Yes, that's correct.

17 Q All right. Have you  
18 ever been involved in the selection of a corridor in  
19 the way you describe on pages nine and ten?

20 A Personally, no. The  
21 company I work for and the people who work for me have  
22 be involved in selection of corridors. I myself have  
23 been involved in the selection of routes within them.

24 Q Well, which corridors,  
25 if you're free to give those answers, would your company  
26 have dealt with or selected?

27 A Well, the currently  
28 undergoing hearings, I guess the hearings have con-  
29 cluded, corridors for a transmission line for Manitoba  
30 Hydro. Primarily routes and routes we have worked on



G. S. Davies  
Cross-Exam by Hollingworth

1 in Ontario for Ontario Hydro. For the Ministry of  
2 Transport for highways in Ontario and for transmission  
3 lines once again in New Brunswick for New Brunswick  
4 Power -- N.B. Power.

5 Q But those --

6 A And those have been mainly  
7 routes.

8 Q With the exception of the  
9 Manitoba experience, those are routes?

10 A Are routes within the  
11 corridor.

12 Q So in other words, you  
13 are given two points, A and B, and asked to pick a  
14 route between them? Is that correct?

15 A We were given a corridor  
16 that had been selected.

17 Q Yes.

18 A -- and a suggested route  
19 within that corridor or in some cases, two or three  
20 possible routes within that corridor and asked to  
21 evaluate those.

22 Q Well, if I can come  
23 back say to the power line in New Brunswick, I think --  
24 I believe you mentioned the powerline in New Brunswick?

25 A Yes, that's correct.

26 Q Surely, the powerline went  
27 from point A, being the source of the power to point B  
28 being the place where the power was to be dispersed?

29 A Yes, that's correct.

30 Q So, in that sense you were





G. S. Davies  
Cross-Exam by Hollingworth

1 given point A and point B and told to pick a route  
2 between the two, weren't you?

3 A Yes, I think what you're  
4 driving -- I think if we can maybe come to this,  
5 corridors at the scale which we're working are obviously  
6 not as long or not as proud I suspect as the type of  
7 corridor that you're evaluating here in this process.

8 Q No, I don't suppose there's  
9 a corridor anywhere in Canada that would be as big as  
10 this is.

11 A Yes. However, I don't  
12 think that changes the approach that we would use to  
13 evaluating corridors or routes. As I see the essential  
14 difference between a short route or short corridor, if  
15 you like and a much longer one of the type you're  
16 referring<sup>to</sup>, is that you would have to compare reaches  
17 of these longer ones with parallel reaches in another  
18 corridor.

19 Q Well, can we go to the  
20 corridor that your company selected in Manitoba. Were  
21 you just given a large area on the map and told you  
22 could pick the ideal corridor from<sup>an environmental</sup> viewpoint or again  
23 did you have point A and point B?

24 A No, we were given a series  
25 of corridors and then asked to evaluate them. It was  
26 the first alternative that I described here, you know,  
27 where the proponent and the proponent's engineering  
28 planning group had said, "Here are possible ways of  
29 going".

30 Q Well where was --



G. S. Davies  
Cross-Exam by Hollingworth

1 A Yes.

2 Q Sorry. Were you taking  
3 the power from a dam or some such project?

4 A No, from a thermal generating station.

5 Q Which was fixed in place already.

6 A There was a previous study which  
7 had fixed it in place  
8 / which was the associated study which our company had  
9 done as well, so that there were two phases actually and  
10 I'm not clear enough on the details of that study any-  
11 more to give you an exact sequencing of that.

12 Q So, point A at least was  
13 selected for you, before you selected your corridor?

14 A Well --

15 Q Whether you had selected  
16 it or not, it was there?

17 A No, we -- yes -- I'm  
18 sorry to be a bit fuzzy. No, we have to select a place  
19 for the thermal generating station so there were alter-  
20 native sites. Once the alternative site had been  
21 placed, as I remember, -- once the site for the  
22 generating station had been selected, then the problem  
23 of corridors was basically eliminated, or brought down  
24 to a much more manageable scale.

25 Q That's right. The corri-  
26 dor wasn't selected until you had point A, was it?

27 A In that case, no.

28 Q What about point B?

29 Where was the power going to?

30 A I'm embarrassed, I can't  
remember.



G. S. Davies  
Cross-Exam by Hollingworth

1 Q It was a substation,  
2 wasn't it? It was a substation or something like that?

3 A Yes. That's right.

4 Q So point B was selected  
5 before you chose your corridor too?

6 A Yes.

7 Q So you were really cut down  
8 considerably in the area that you had to choose this  
9 corridor from, weren't you?

10 A Yes.

11 Q Very much so.

12 A Yes.

13 Q In much the same way as  
14 the proponents of this gas pipeline have been?

15 A Yes if -- we don't think  
16 that's ideal. It's not an ideal situation, agreed.  
17 However, just as a postscript to that. There is a  
18 reasonable amount of degree. It is quite a degree, of  
19 latitude within the corridor, however, for making de-  
20 cisions as to alignments.

21 Q To pick a route.

22 A Yes.

23 Q Yes, but we're talking  
24 about a corridor right now.

25 A Yes, all right.

26 Q Well sir, isn't it true  
27 that the methods that you've outlined for evaluating  
28 corridors and routes all have their inherent strong and  
29 weak points?

30 A It's difficult to





G. S. Davies  
Cross-Exam by Hollingworth

1 disagree with that, yes.

2 Q Yes, yes. What could be  
3 the best method in one case, may not necessarily be  
4 the best in another case?

5 A Yes, you have to treat  
6 each project as it comes, I think.

7 Q Would you agree that a  
8 location which could be construed as less than optimum  
9 in the environmental sense, if you have in the short  
10 term, such as during the construction phase of pipeline  
11 development could be the preferable route in the long  
12 term?

13 A Yes, it could.

14 Q Have you reviewed the  
15 evidence in volume 59 and 60 given by the Foothills  
16 location panel at this Inquiry?

17 A Not recently, Mr.  
18 Hollingworth, but I was aware of it at one time and  
19 did read it, yes.

20 Q Do you regard it as  
21 possible to select an environmentally acceptable route  
22 by the procedures being followed by Foothills?

23 A I'm sorry, I'd have to  
24 reread that, I think, Mr. Hollingworth. Maybe if you  
25 could answer what route selection choices did Foothills  
26 have, maybe that would trip my memory so that I might  
27 recall.

28 Q Well the evidence of the  
29 location panel was that it adopted in a large part the  
30 route down the Mackenzie picked by the consortium



1 which it was formerly a member; that is, Arctic Gas,  
2 but that it did alter the route in the middle third  
3 and plus it picked the laterals to the communities.



G. S. Davies  
Cross-Exam by Hollingworth  
Cross-Exam by Marshall

1 A I would have to review  
2 it, I think, again, to answer that question.

3 MR. HOLLINGWORTH: I have no  
4 further questions, thank you.

5  
6 CROSS-EXAMINATION BY MR. MARSHALL:

7 Q Just following up the  
8 point that Mr. Hollingworth was making, I take it you'd  
9 agree that what matters in the final analysis is getting  
10 an environmentally acceptable route.

11 A Yes, that's correct.

12 Q And the way you get there  
13 isn't nearly as important as getting there. In other  
14 words, the end result is an environmentally acceptable  
15 route, that's what we're aiming for.

16 A Yes. How you get there  
17 has got me somewhat mystified, but --

18 Q Well, it may have you  
19 somewhat mystified, sir, but if we got to the right point  
20 isn't the objective achieved?

21 A Sorry, there was some  
22 noise, I couldn't hear you.

23 Q If we've ended up with a  
24 route that is environmentally acceptable, then wouldn't  
25 the objective have been achieved, regardless of how  
26 one got there?

27 A I think I'd have to say  
28 "Yes", but I'm a little hesitant about that.

29 Q I gather from your discus-  
30 sion with my learned friends that you have not been





G.S. Davies  
Cross-Exam by Marshall

1 involved in any pipeline projects.

2 A Not as of yet, no.

3 Q Have you had a chance to  
4 read the Environmental Reports that were done for  
5 Arctic Gas and Foothills? I'm thinking particularly  
6 of the reports that were set out in the Biological  
7 Report series and the cross-delta reports that have been  
8 filed with this Inquiry.

9 A I've read some sections  
10 of several of the biological studies, and I had a chance  
11 to glance very quickly over the cross-delta application.

12 Q I'm not faulting you for  
13 not having done so, sir. I think there are probably  
14 few in the room who have made it through that great  
15 mass of reports. Now, sir, I had a little bit of  
16 difficulty with the application of the various tests  
17 that you were proposing to determine environmental  
18 acceptability of various routes. I wonder if you'd  
19 agree with me that in determining which routes are to  
20 be chosen over the other, one would have to weigh, among  
21 other things, the engineering feasibility of building  
22 say a pipeline over particular terrain. That would  
23 surely be a factor, wouldn't it?

24 A Oh yes, and routinely  
25 at the beginning of a project we would consider an  
26 alignment or a site whichever, on grounds of whether  
27 or not it was technically feasible to take the project  
28 there before we began to do much more.

29 Q Well, surely that is  
30 of paramount importance. You have to determine whether



G.S. Davies  
Cross-Exam by Marshall

1 or not it would be feasible, and whether you could  
2 engineer a pipeline through that area, and whether  
3 you could construct it. Those would be vital consider-  
4 ations.

5 A Certainly .

6 Q And you'd want to do those  
7 before you did your environmental impact assessment.

8 A I think they should  
9 certainly be initiated before an environmental impact  
10 assessment begins, there may be some latitude to have  
11 overlap between the two, but yes, I think I agree with  
12 you basically.

13 Q Now, sir, another factor  
14 that would have to be weighed would be a schedule, and  
15 I suppose this really relates to technical feasibility.  
16 That is could you build along a particular corridor  
17 or route within an acceptable time frame? That would be  
18 a factor that would have to be considered, would it not?

19 A Timing?

20 Q Scheduling.

21 A Scheduling, yes. I might  
22 just step back one step here and point out that although  
23 you may not begin detailed environmental assessm ent  
24 studies at the same time as you're looking at technical  
25 feasibility studies, I think we would in fact ask for  
26 or should ask for some sort of environmental input at the  
27 beginning, however.

28 Q And when a decision is  
29 made as between different alternative routings, one  
30 would have to weigh capital expenditures that each would



G.S. Davies  
Cross-Exam by Marshall

1 entail.

2 A Yes, that's right,

3 Q And resource requirements.

4 A Yes.

5 Q And I'm thinking here of  
6 land, gravel, water --

7 A Yes.

8 Q -- lumber and things such  
9 as labor, equipment, fuel, pipes and so on.

10 A Yes, that's right. We  
11 would list these under technical requirements for the  
12 project, or technical feasibility.

13 Q Then one would have to  
14 weigh various environmental factors, physical environ-  
15 ment and living environment.

16 A Yes, that's correct.

17 Q And one would have to weigh  
18 social considerations as the guidelines make reference  
19 to that.

20 A Yes, they're being asked to

21 Q Economic considerations.

22 A Yes.

23 Q Both micro-economic and  
24 macro-economic considerations.

25 A Well, in this case you  
26 have certainly been asked to do that, that's correct.

27 Q Now I take it that you  
28 see a number of these being amenable to an objective  
29 determination or evaluation.

30 A Not all but some, yes.





G.S. Davies  
Cross-Exam by Marshall

1 Q For example capital  
2 expenditure, you can say so many dollars, X dollars  
3 as opposed to Y dollars, and you can weigh one alternative  
4 against another alternative fairly simply in that  
5 manner.

6 A Yes, it's simple. It  
7 also relies upon the fact that a careful economic  
8 analysis has been done, however, and I don't think one  
9 should blindly accept that the calculated costs are  
10 necessarily the correct ones or the final ones.

11 Q Well, assuming that that  
12 has been done correctly, and assuming as you have  
13 agreed with me, that one must give consideration to  
14 all of these various engineering, environmental, socio-  
15 economic, <sup>factors</sup> now sir I can understand how you can take each  
16 one of those separate factors individually and say with  
17 respect, for example, to resource requirements, alternative  
18 A seems to be better than alternative B, because you  
19 use less gravel or you use less pipe or whatever the  
20 case might be. But who in your system makes the  
21 determination of the relative weight to be given to each  
22 of those subject areas? For example, who is going to  
23 weigh borrow requirements against birds? How do you  
24 do that? What's the mechanism for doing that?

25 A It's certainly a question  
26 which is a tough one to answer, obviously, but who does  
27 it is not tough. In the first instance it's your  
28 project team, by definition. It's the team of consultants  
29 that you've assembled, it's the engineers or what have  
30 you supplied by the clients to the project <sup>team</sup> and these are



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Cross-Exam by Marshall

1 the people who make the decisions. I think ideally they  
2 make them jointly, however, I don't think they make  
3 them unilaterally. I don't think the borrow specialist,  
4 if there is such a being, sits down and passes the  
5 final word on it.

6 Q I think we call them  
7 borrow persons.

8 A Borrow persons.

9 Q Or gravel persons. Yes  
10 there are experts in such matters, sir, and indeed there  
11 have been experts in most of these other areas who have  
12 been called before the Inquiry and have given very  
13 lengthy testimony and been cross-examined on it.

14 A Yes.

15 Q So then you would see if you  
16 agree that all of these areas must be weighed, that  
17 there would be a requirement for experts in all of  
18 these areas to pool their information and in some way  
19 or other have the competing claims, if you like, and the  
20 tradeoffs made within this pool of resource people.

21 A Yes, it's not outside my  
22 experience, for example, to have an engineer or a  
23 geologist ask questions of a biologist which <sup>may</sup> make him  
24 concede in discussion that although he feels that his  
25 bird concerns are important, that in fact against all  
26 bird concerns in the region they may in fact take a  
27 secondary claim to somebody else's counter-claims about  
28 the gravel requirements.

29 Q Well, I put it to you  
30 this way, if I can borrow Mr. Scott's pet phrase, that



G.S. Davies  
Cross-Exam by Marshall

1 really in the final analysis it gets down to a judgment  
2 call by the expert involved. That is the bird man as  
3 opposed to the gravel person having to make a subjective  
4 judgment based on past experience, hopefully, saying  
5 that having listened to the competing concern, "I judge  
6 that to be more worthy of our attention than my concern."  
7 IN other words, "I view gravel here as being more  
8 important than the birds." Doesn't it really get down  
9 to a subjective judgment by the experts having this  
10 knowledge and having listened to competing claims being  
11 put forward by other environmentalists and engineers  
12 and so on?

13 A I think you're right but  
14 I would say that you can't stop at the point where the  
15 biologist says that these are concerns that are very  
16 great to me. You have to ask him, why are they great?  
17 You have to ask him to give rationale behind this  
18 bald statement.

19 Q But in your weighing  
20 requirement, and that's implicit in the model that  
21 you're putting forward, somebody has to say in this  
22 case, "I'm going to assign a value in a scale of 1 to 5,  
23 I'm going to assign a value of 3 to the borrow problem  
24 and a value of 4 to the bird problem," or vice versa.  
25 See, somebody has to make the -- do the weighing so that  
26 you can tote up the pros and cons of the various  
27 alternatives.

28 A Well, we in a recent  
29 approach we completed in Ontario, we had a project in  
30 which there were four objectives, four environmental





G.S. Davies  
Cross-Exam by Marshall

1 objectives, four motherhood statements, if you like, and  
2 each one of those objectives was given a weight, now  
3 the weighting of the objectives was a decision made by  
4 the entire project team. It was argued out and they  
5 decided, you know, if the terrestrial environment  
6 was going to be worth as much as the social economic  
7 environment, so that that sort of consensus was made  
8 by the team. But when you got to one of those objectives,  
9 Mr. Marshall, and talked about the criteria that you  
10 would develop to measure the objective attainment, then  
11 you might have been talking about two or three experts  
12 weighting there.

13 Q I think we're on common  
14 ground there. It's as between competing objectives, that  
15 is going from one discipline to another discipline, and  
16 would you agree with me that ultimately it gets down  
17 to a judgment call?

18 A Ultimately, yes.

19 Q Now really isn't that  
20 what's happened here, that there have been experts in  
21 a vast number of various disciplines, in the environ-  
22 mental disciplines and I include the physical environ-  
23 ment, and the living environment, engineering, costs and  
24 so on, and there has been a weighing going on of the  
25 various competing interests?

26 A Yes, it seems to have come  
27 out rather indirectly and under cross-examination, it's  
28 very difficult to find out, just to use my own terminology,  
29 what your objectives were and how you did in fact measure  
30 them. It's all come out after the fact, if you like.



G.S. Davies  
Cross-Exam by Marshall

Q Well, sir, have you read  
all of the environmental reports that have been done?

A No, not all of them.  
No, not by any means.

Q So you're not familiar  
with all of the work that has been presented to the  
Inquiry or all the deliberations that have taken place  
after the Inquiry?

A No.

Q Sir, I take it that you  
have not applied to this point in time at least any of  
the systems that you've described to either of the  
pipeline proposals, done a detailed sort of analysis  
with the tradeoffs and so on that you set out in your  
various models?

A No, I have not done that.  
I wouldn't attempt to do that myself because I don't  
have the on-site knowledge.

MR. MARSHALL: Thank you. I have  
no further questions.



G.S. Davies  
Re-examination

1 RE-EXAMINATION BY MR. GOUDGE:

2 MR. GOUDGE: Just one question  
3 in reply, Dr. Davies, you said in answer to my friend,  
4 Mr. Marshall, as I understood you, is that if an  
5 environmentally acceptable route is attained that you  
6 agreed with Mr. Marshall that it didn't much matter  
7 how you got to that point.

8 A Well,--

9 Q Can I ask you how that  
10 squares with your earlier evidence that the process  
11 by which you do arrive at such a route be open,  
12 demonstrable and able to sustain public analysis.

13 A Yes, that's why I was  
14 hesitating. My mind isn't very clear at this point in  
15 the afternoon and I guess, you know, the means of  
16 getting to the end are not always desirable, are they?  
17 And I was trying desperately to define for Mr. Marshall  
18 what my objection was and I couldn't think of it but  
19 yes, one objection could be that if it takes us  
20 countless months of debate at the Inquiry to get there  
21 and countless thousands of dollars being expended then  
22 to get to the right route, then it may not be justifiable,  
23 yes. It's commendable that you get there, but maybe  
24 it could have been done more easily, yes.

25 Q So what's your position  
26 as to the importance of the process by which you do  
27 arrive at the environmentally acceptable route?

28 A I think the process is  
29 extremely important, not simply as a matter of form  
30 but it reflects the content and the understanding of





G.S. Davies  
Re-Examination

1 the individual experts that have been involved in the  
2 exercise and if it is not easily identifiable then I  
3 suggest that the process has been ad hoc and rather  
4 accidental.

5 MR. GOUDGE: Thank you, sir.  
6 Those are all the questions I have of Dr. Davies.

7 THE COMMISSIONER: Thank you  
8 very much, Dr. Davies.

9 (WITNESS ASIDE)

10 MR. GOUDGE: I would propose  
11 now, sir, to proceed with our next panel which consists  
12 of four gentlemen dealing with the subject of game  
13 management.

14 THE COMMISSIONER: All right.

15 MR. GOUDGE: Would the next  
16 panel please take their places at the table?  
DIRECT EXAMINATION BY MR. GOUDGE:

17 D.H. MOSSOP

18 NORMAN M. SIMMONS

19 W.J. STEPHEN

20 DAVID W. NORTON, sworn: .

21 Q I will introduce  
22 the members of the panel to you and it will consist to  
23 reading from your left to right is Dr. Norman Simmons,  
24 the superintendent of Fish and Wildlife Service of  
25 the government of the Northwest Territories. Next to  
26 him is Mr. David Mossop, who is the wildlife biologist  
27 with the Game Branch, government of the Yukon Territory.  
28 Next to him is Dr. W.J.D. Stephen, regional director  
29 Western Region, Canadian Wildlife Service and on the  
30 right end of the panel is Dr. David Norton, affiliate  
31 assistant professor of ecology in the Institute of



Mossop, Simmons, Stephen  
Norton  
In Chief

Arctic Biology at the University of Alaska. I would propose, sir, to qualify these gentlemen in the order in which I have asked them to give their evidence and then proceed with the reading of their evidence in chief.

Mr. Mossop, could I start with you, please? You are, as I understand it, as I gave it a minute ago the -- a wildlife biologist with the Game Branch Government of the Yukon Territory based in Whitehorse?

WITNESS MOSSOP: That's correct.

Q And your education began at the post-secondary level at the University of Manitoba where you graduated with a Bachelor of Science in 1966, and you then went on to take your Master of Science at U.B.C. graduating in 1970 and you're presently engaged in a Ph.D. program at the University of British Columbia. Is that correct?

A That's correct. Yes.

Q And your employment experience relating to this Inquiry began in 1963, when for three years you served as a research assistant at the University of Manitoba in the Botany Department with the Manitoba Wildlife Branch in the Canadian Wildlife Service. Is that so?

A Yes, that's correct.

Q And for the following three years, 1966 to 1969, you were a teaching assistant



Mossop, Simmons, Stephen  
Norton  
In Chief

at the University of British Columbia. Is that right?

A Yes, that's right.

Q And for the following  
four years -- 1970 to 1974 -- a contract biologist  
with the variety of both companies and government  
departments including Synergy West Ltd. of Calgary,  
Kluane National Park and the Department of the  
Environment in Ottawa. Is that so?

A Yes, that is so.

Q In 1974-75, you were a  
field biologist casual with the Yukon Game Branch  
based in Whitehorse and in 1975 you moved to your  
present position. Is that correct?

A Yes, it's correct.

Q Now, if I may move next  
to you, Dr. Simmons. I take it I was correct in  
titling you the superintendent of Fish and Wildlife  
Service, Government of the Northwest Territories based  
in Yellowknife.

WITNESS SIMMONS: That's  
right.

Q And your post-secondary  
education as I understand it, consists of a B.A. in  
Business Administration from Claremont Men's College  
in California, a Master of Science in Wildlife Biology  
from Colorado State University and a Ph.D. in Wildlife  
Biology from the University of Arizona. Is that so?

A Correct.

Q And your work experience  
of relevance to this Inquiry consists of service from





Mossop, Simmons, Stephen  
Norton  
In Chief

1 June, 1961 to September of 1965 as Refuge Manager, U.S.  
2 Fish and Wildlife Service in Yuma, Arizona where you  
3 conducted research on desert bighorn sheep social  
4 organization and behaviour.  
5

6 Then from September 1966 to  
7 March 1975 as scientific advisor to the Government of  
8 the Northwest Territories, Canadian Wildlife Service based  
9 in Fort Smith, Northwest Territories where your research  
10 included work on Dall sheep distribution, abundance,  
11 population dynamics, seasonal movements and woodland  
12 caribou productivity, seasonal movements and effects  
13 of hunter kill. Further research in connection with a  
14 bison study and on the ecology of the Nahanni.

15 And, finally, well, I'm sorry,  
16 from March 1975 to September 1975 you were a member of  
17 the Inquiry Appraisal Team of the Mackenzie Valley  
18 Pipeline Inquiry and in October of 1975 you took up  
19 your present position. Is that correct?

20 A That is correct.

21 Q And your professional  
22 societies include the Wildlife Society, the American  
23 Society of Mammalogists, the Canadian Society of  
24 Fisheries and Wildlife Biologists, the Canadian Botanical  
25 Association and the Desert Bighorn Council.

26 A Right.

27 Q What is that -- the  
28 Desert Bighorn Council -- just because I'm curious?

29 A Excuse me?

30 Q What's the Desert Bighorn



Mossop, Simmons, Stephen  
Norton  
In Chief

1  
2 Council?

3 A That hasn't<sup>got</sup> much to do  
4 with this hearing but it is a group of people interested  
5 in preservation of what was almost -- well, what was for  
6 quite a while an endangered species.

7 Q Thank you, Dr. Simmons.  
8 If I can move next to you, Dr. Stephen. Your post-  
9 secondary education, as I understand it consists of  
10 a Bachelor of Science at the University of Guelph with  
11 a major in biology, a Master of Science from the  
12 University of Guelph with a thesis on "Distraction  
13 Display in Mallards" and a Ph.D. from the University  
14 of Saskatchewan, I take it again in biology. Is that  
15 so?

16 WITNESS STEPHEN: That's right.

17 Q And your work experience  
18 of relevance to this Inquiry as I understand it consists  
19 of experience in 1958 with the Province of Manitoba  
20 Game Branch followed by 7 years from 1959 to 1966 as  
21 a research scientist with the Canadian Wildlife Service  
22 followed by 2 years, 1966 to '68 as supervisor of  
23 lands with the Department of the Environment as it then  
24 was. 1968 to 1970, you were a science advisor to the  
25 Science Council of Canada. 1970 to 1974, you were  
26 manager of Research and Surveys of the Canadian  
27 Wildlife Service Western Region and in 1974, you took  
28 up your present position which I described earlier. Is  
29 that correct?

30 A That's correct.



Mossop, Simmons, Stephen  
Norton  
In Chief

1  
2 Q And then finally, Dr.  
3 Norton, if I can move to you. As I understand, your  
4 post-secondary education, you received your A.B. from  
5 Harvard in 1967 in biology, your Master of Science  
6 from the University of Alaska in zoology and your  
7 Ph.D. from the same university in 1973 in zoo physiology.  
8 Is that so?

9 WITNESS NORTON: That is  
10 correct.

11 Q And once again, your  
12 work history of relevance to this Inquiry consists of  
13 your experience as research coordinator in National  
14 Oceanic and Atmospheric Administration and Outer  
15 Continental Shelf Arctic Project Office and Research  
16 Management Office, State of Alaska. That, I take it, was  
17 work experience you underwent in 1975?

18 A This is ongoing.

19 Q I see. You are presently  
20 engaged in that function?

21 A Correct.

22 Q You as well have engaged  
23 yourself as a habitat biologist for the Alaska  
24 Department of Fish and Game from 1974 to 1975 and  
25 academically speaking you have been a visiting assistant  
26 professor of ecology at Boston University and in your  
27 present position as affiliate assistant professor of  
28 ecology at the Institute of Arctic Biology, University  
29 of Alaska in Fairbanks. Is that so?

30 A There is an omission there





Mossop, Simmons, Stephen, Norton  
In Chief

1 and I should point out that I must not have learned to  
2 write -- handwrite -- very well but as habitat biologist  
3 with the Department of Fish and Game -- my job was, as  
4 supervisor of the Department of Fish and Games Pipeline  
5 Surveillance Team.

6 Q And it is in that  
7 connection particularly that you gained the experience  
8 about which you will be telling us in due course?

9 A That is correct.

10 Q Yes, now Mr. Commissioner,  
11 that is the panel before you. I propose that they  
12 read their evidence into the record in the order in  
13 which I introduced them to you. And perhaps Mr.  
14 Mossop, we can begin with you.

15 Do you have copies of  
16 this, Mr. Commissioner?

17 WITNESS MOSSOP: Mr. Commissioner,  
18 the contribution the Yukon Territorial Game Branch  
19 feels it can make to this Inquiry is a kind of  
20 pre-analysis of our response to management problems which  
21 the construction and maintenance of a northern pipeline  
22 will create. We intend to describe from other  
23 areas in the territory the kinds of problems encountered  
24 when new areas are opened to activity. We can predict  
25 the influence our Branch can have in such instances, and  
26 we can offer our opinion based on our experience about  
27 what kinds of mitigative measures can be taken.

28 The Yukon Territory of the  
29 geographic areas influenced by this project is perhaps  
30 in an ideal position to make this kind of analysis.



Mossop, Simmons, Stephen, Norton  
In Chief

1 The reason for this is our history, a "boom and bust"  
2 type of activity written around the mining industry.  
3 We can look to large influxes of people to pristine  
4 country somewhat analogous to the pipeline  
5 construction we are here contemplating, and analyze  
6 their influence on the same kinds of creatures as will  
7 be encountered in the far north.

8 Our mandate in the Yukon  
9 Territory unfortunately does not include management  
10 of wildlife habitat and I feel it is important  
11 for you to weigh our concerns in this light. We can only  
12 hope that an adequate picture of the consequences to  
13 the basic productive nature of the land on which our  
14 wildlife is dependent will be presented by those in  
15 whose hands these matters rest.

16 I will therefore be  
17 talking primarily about matters which affect wild  
18 creatures directly: harvest harassment and what have  
19 you, and consequences to population demography and  
20 turnover, all of which I feel need clearer stating  
21 before this Inquiry.

22 (QUALIFICATIONS AND EVIDENCE OF D.H. MOSSOP MARKED  
EXHIBIT 531)

23 (QUALIFICATIONS AND EVIDENCE OF N.M. SIMMONS MARKED  
EXHIBIT 532)

24 (QUALIFICATIONS AND EVIDENCE OF W.J.D. STEPHEN  
25 MARKED EXHIBIT 533)

26 (QUALIFICATIONS AND EVIDENCE OF D.W. NORTAN MARKED  
EXHIBIT 534)

27  
28  
29  
30



Mossop, Simmons,  
Stephen, Norton  
In Chief

1 I would like to start then with  
2 a discussion of the historical perspective of management in the  
3 Arctic Yukon. I think the picture of the intact natural  
4 system in the Arctic Yukon Territory with its 100,000  
5 caribou and 600,000 waterbirds, surprisingly product-  
6 ive aquatic communities, furbearer populations, et cetera  
7 has been adequately described and impressed on all those  
8 involved in this Inquiry. There should be no doubt  
9 that the northern Yukon is already a very active and  
10 productive place. New activity, we can only pray, will  
11 be weighed in value with the value of what is already  
12 going on in that land.

13 What I feel has not been ad-  
14 equately described, is the state of readiness in which  
15 we find the managing authority in whose hands rest the  
16 responsibility for the wellbeing of those animal  
17 communities. The Yukon Game Branch made its first visit  
18 to the Yukon north coast only in 1970. From 1971 to '74,  
19 our only presence there was in the form of a monthly  
20 patrol flight by members of the Whitehorse staff.

21 This program was replaced in  
22 1974 by a small summer program combining management  
23 oriented research and patrols. These attempts by our  
24 branch to become active in the north have been made at  
25 the request of our Commissioner primarily in response  
26 to the pipeline related activity over the last few years.

27 Our present program is very  
28 much an embryonic presence in the north. There is no  
29 permanent detachment in the Yukon north of Dawson City  
30 and enforcement in the north is carried out by





Mossop, Simmons,  
Stephn, Norton  
In Chief

1 conservation officers borrowed from the south for short  
2 periods. Perhaps even more desperate is our tiny effort  
3 to gather management data for the wildlife populations  
4 of the north. In the time frame available to us and  
5 present capabilities, it will be completely impossible  
6 to make meaningful management decisions during pipeline  
7 construction.

8 Wildlife management, even in  
9 the southern Yukon Territory, is in its formative  
10 stages. The first biologist on staff was hired in 1972  
11 and presently two biologists and two technicians make  
12 up the entire technical staff for the whole of the  
13 Yukon Territory.

14 Of 11 management zones in  
15 the territory, three southern ones have been covered  
16 in a preliminary big game census program and harvest  
17 adjustments based on that work were commenced only last  
18 year.

19 The point we wish to make is  
20 this: the applicant has indicated that gathering  
21 management oriented data and devising management schemes  
22 relative to the areas affected by the pipeline con-  
23 struction is the responsibility of the managing  
24 authority. This Inquiry should be informed that such a  
25 managing agency in the northern Yukon Territory simply  
26 does not exist. The Yukon Game Branch will have to  
27 expand its program in the north to an effective managing  
28 agency in direct response to the pipeline construction  
29 and in an unrealistically short time.

30 I'd like now to enter a



Mossop, Simmons,  
Stephen, Norton  
In Chief

1 discussion on the response capabilities of the Yukon  
2 Game Branch as indicated by our historical record.

3 As mentioned, the Yukon has  
4 experienced a series of booms in activity and develop-  
5 ment. I wish to present two comparisons. One is of  
6 the total number of people in the Yukon engaged in  
7 sport hunting. For this, I'd like to use the overhead  
8 projector, if I might.

9 What this is is a  
10 copy of figure one in the written testimony, which is  
11 now sideways on the screen.

12 As it turns out, that's number  
13 two we've got on there now. They should be both  
14 focused now. What the figure shows in the top line  
15 is a plotting of the total sport hunting license sales  
16 throughout the Yukon Territory over the time shown,  
17 from '52 to '76 with the demonstrated fluctuations in  
18 the total license sales.

19 This is a fairly close  
20 approximation of the changes in the total human popula-  
21 tion of the Yukon Territory over that period compared to  
22 the development of the Yukon Game Branch in terms of  
23 staff members; the total staff size by '76 is approximate-  
24 ly 18 members and the '52 to approximately '55 value  
25 is two staff members.

26 What it does is indicate  
27 that there is really no relationship at all between the  
28 fluctuations in this one measure of pressure on the  
29 wildlife populations in the Yukon Territory and the  
30 development of the Yukon Game Branch. The Game Branch



Mossop, Simmons,  
Stephen, Norton  
In Chief

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is exhibiting a slow, almost linear development in spite of the pressures on the wildlife populations.

The second comparison I want to make is perhaps a bit more meaningful for the purposes of this Inquiry. It compares a more recent regional boom of activity in the mining exploration activity which has been taking place in the Mayo District over the last few years. If I can have the second transparency?

THE COMMISSIONER: Where is Mayo?

What you mean by the Mayo district? Maybe that would be --

A The Mayo district that I'm referring to is in the eastern central part of the Yukon Territory.

Q Yes.

A Yes, the line goes up. That's correct yes. The solid upper line joining the crosses is a measure of this activity, this increase in the activity in the Mayo district which is a measure, which is a plotting of the aircraft movements from the Mayo airport over the years shown and below it is the patrol effort by the conservation officer in this area which, again, shows no relationship.

The influx that we're talking about here has occurred to relatively pristine country with very good by poorly known wildlife populations and has involved technical activity and large numbers of personnel, many of whom are nonresidents of the territory.





Mossop, Simmons  
Stephen, Norton  
In Chief

We have used the number of aircraft movements recorded as our measure of activity because in many ways it is the highly versatile aerial support logistics typical of activity in the territory which poses enforcement and other related problems to the managing body.

The response by the Game Branch to the five-fold increase in activity was virtually nil. The one staff member assigned to this region simply did not have the monetary capability to respond to the boom. No allowance is made for this kind of unforeseen demand in our budget.

From this, we can predict that even with the best of intentions on our part, we will be unable to make an adequate response to the activity in the north where costs are even more prohibitive.

I will <sup>now</sup> engage in a discussion of the nature of problems created by new activity. It has been our experience that alpine animals and those occupying open tundra are in a special category relative to interaction with human activity. We know very little about the actual mechanics of what happens. This is an area very much in need of study. What we can record is the disappearance of these creatures in case after case when new areas are open to human activity.

Many of the animals involved are the same ones as are found in the Arctic Yukon; caribou, dall sheep and grizzly bear.

We can cite many cases of this



Mossop, Simmons,  
Stephen, Norton  
In Chief

1 phenomenon from the southern Yukon. Montana Mountain  
2 is an area of about 160 square miles with a long history  
3 of excellent big game populations. Before the 1940's,  
4 access to the area was very restricted. About that time,  
5 a roadway in support of mining was improved and extended  
6 by the 1960's to allow vehicular traffic to most of the  
7 alpine area.

8 The area of actual wildlife  
9 habitat used up in the roadway and three abandoned  
10 mine sites is minimal and there has been no mining  
11 activity in the area for the last five years. Yet the  
12 effect on the wildlife populations has been dramatic.  
13 A large dall sheep population which was estimated at  
14 over 200 has been exterminated completely. A famous  
15 caribou population which was hunted during migration,  
16 and from which the town of Carcross got its name, has been  
17 reduced to a remnant. A goat population which was, at  
18 one time, relatively large, now numbers less than ten.  
19 Grizzlies have disappeared from the area completely.

20 More recent cases can be out-  
21 lined with better census data. The Sifton Range is an  
22 area of alpinetundra of about 150 square miles. Some of  
23 the finest dall sheeep trophies have been taken in this  
24 area. In 1973, an operator simply made a bulldozer  
25 trail into the area, allowing access by four-wheel  
26 drive. The result to date has been the disappearance of  
27 a relic goat population and the abandonment of over  
28 half of the original sheep habitat.

29 It is important to realize  
30 that these dramatic effects occur within the restrictions



Mossop, Simmons,  
Stephen, Norton  
In Chief

1 of the Yukon Game Ordinance for the taking of game.  
2 Access related problems go far beyond the simple process  
3 of allowing hunters the opportunity to harvest game  
4 although this is undoubtedly involved. There are aspects  
5 of the presence of roads and their use by people, per-  
6 haps compounded by the illegal harvest of game by the  
7 hunters which research data has not elucidated. The very  
8 traditions of use of alpine ranges have been altered by  
9 access construction.

10 I submit that the winter access  
11 routes, the airstrips, the buildings and especially  
12 any all-weather roads the construction and maintenance  
13 of the northern pipeline will create offer opportunity  
14 for access to the northern areas where there was none  
15 before.

16 We also submit, based on our  
17 experience, that these facilities will be used by  
18 increasing numbers of people and that restrictions on  
19 their use will never be realized.

20 The Dempster highway must be  
21 considered a special case of increased access related  
22 to the pipeline construction. Whether or not it is  
23 agreed that the pipeline is being built in anticipation  
24 of the pipe construction, it will undoubtedly be used  
25 by ancillary activity relative to the pipe and will be  
26 a prime route for access by persons visiting the con-  
27 struction area out of curiosity and other reasons.  
28  
29  
30





Mossop, Simmons, Stephen, Norton  
In Chief

1 All-weather roads in the Yukon  
2 pose the additional problem of offering a main trunk  
3 for the construction of laterals. Until recently, private  
4 construction of minor roadways has occurred in the Yukon  
5 with very little control. This ultimately has opened  
6 an ever-increasing area to access. This, although it  
7 may not bear directly on this Inquiry, gives a picture  
8 of the magnitude of influence a road like the Dempster  
9 has on wildlife. The response of the managing agency  
10 ideally should follow along with the effects on the  
11 wildlife population.

12 The exposure of endangered  
13 species, such as the peregrine falcon, to new access is,  
14 of course, a special case. The disturbance studies con-  
15 ducted near falcon nests were some of the best work done  
16 in support of the pipeline. However, we would fault  
17 them because they may have ignored the most important  
18 threat to the nest sites. We are convinced that the  
19 most pressing problem will be an influx of persons who  
20 for a variety of reasons including the poaching of young  
21 birds for falconry, will disturb nest sites and jeopar-  
22 dize productivity. The level of surveillance necessary  
23 to prevent this problem is very costly.

24 These points give in a general  
25 way the kinds of problems that will arise in the area  
26 of increased activity. They should leave no doubt that  
27 when the pipeline is begun the managing agency will have  
28 to become active immediately and that this activity will  
29 never be safely terminated.

30 I'll now go into a discussion



Mossop, Simmons, Stephen, Norton  
In Chief

oriented  
1 of the management/research requirements which we feel  
2 are necessary.

3 MR. BAYLY: I'm not sure the  
4 evidence was read the way it is written here, and I'm  
5 just wondering if the confusion is going to be perpetuated  
6 on the record? It's on page 9 in the last paragraph  
7 there's a word "Highway" in the fourth line from the  
8 bottom and I wonder if it was intentional to change  
9 that to "pipeline"? Mr. Mossop said "pipeline" rather  
10 than "highway".

11 THE COMMISSIONER: You mean  
12 that the pipeline is being built in the face of pipeline  
13 construction, is that what Mr. Mossop said?

14 MR. BAYLY: That's what was  
15 said, yes.

16 THE COMMISSIONER: I'm sure  
17 that he meant "highway". "Highway being built" instead  
18 of "pipeline".

19 A Yes, I'm sorry, that's  
20 "Highway."

21 THE COMMISSIONER: All right.

22 A The dilemma facing the  
23 managing body is that there is no time being offered  
24 in which to develop managing policy. The uncertainty  
25 of the construction precludes any budgeting of funds  
26 and at best we will be able to move into the area only  
27 in the 11th hour.

28 The research that has already  
29 been done in the north in support of the pipeline  
30 application is extremely valuable as far as it goes



Mossop, Simmons, Stephen, Norton  
In Chief

1 and it should not be belittled. However, it is largely  
2 inventory in nature and as explained by the various  
3 researchers, it was not designed to give management  
4 decisions. We readily agree that the responsibility for  
5 devising management plans rests with the government  
6 agency involved. The Game Branch in the Yukon is ready  
7 to accept this responsibility given the capabilities to  
8 do so.

9                   The first stage, as we see it,  
10 is a gathering together of all the information which has  
11 already been produced and extracting everything which is  
12 of management significance. There is no one in our branch  
13 who has had the time to even read through all that is av-  
14 ailable outside that referring to mammals and birds  
15 directly. Quite frankly, we see some responsibility  
16 for this lying with the applicant.

17                   From this the gaps will emerge.  
18 Basically what is needed in management is data on popul-  
19 ation dynamics. In most instances this kind of data  
20 can be accumulated only by setting up a continuing  
21 program to gather the exact same kind of information  
22 annually.

23                   An example of an important  
24 unknown in the case of the Porcupine caribou herd is  
25 the annual kill by native people. We have estimates of  
26 this value but no one has actually taken the time to  
27 establish a program to measure the harvest annually.  
28 Nor was a standard method of measuring recruitment  
29 devised by the various caribou workers so this value  
30 is different depending on whose report you read. We





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1 know very little about the natural mortality of the  
2 herd; its winter ecology contains many important  
3 mysteries, most of which have already been named by  
4 others; and perhaps even more critical we understand  
5 surprisingly little about the total ecology of caribou  
6 on their calving grounds.

7 Another whole series of  
8 questions are unanswered relative to caribou and the  
9 Dempster Highway. The Yukon Game Branch has posed these  
10 questions in the past and has made repeated attempts  
11 to interest the Canadian Wildlife Service in solving  
12 them with no major success. In a seeming desperation  
13 attempt, the Game Branch has tried applying management  
14 techniques without the research on which to base it.  
15 We have tried closing sections of the roadway to hunt-  
16 ing -- forming corridors to allow caribou crossing.  
17 This apparently had little effect so we tried closing  
18 the whole highway to hunting in the mornings to allow  
19 caribou a crossing during the night and morning. In  
20 the meantime five years have gone by; our experimenting  
21 seems to have been a failure and still we have no basic  
22 research on which to base policy.

23 Mr. Commissioner, without  
24 belaboring the fact that more research needs to be  
25 done before we can begin managing the wildlife in the  
26 northern Yukon, consider two other examples. The Dall  
27 sheep of the British and Richardson Mountains in the  
28 Yukon are virtually unhunted. With the completion of  
29 access to the north, because of the pipeline, these  
30 populations are going to be subjected to immediate



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1 hunting pressure. Without a comprehensive study of  
2 the productivity, mortality and annual ecological cycle  
3 of events, there is no way to determine if a harvest  
4 should be allowed at all, let alone how large it should  
5 be.

6 The sport fishery is another pr-  
7 essing example. Dr. McCart has stated before this  
8 Inquiry that life history study is needed, along with  
9 productivity measurements, before the stability of fish  
10 populations can be known. There are a number of  
11 very well-known fish runs in the Northern Yukon which  
12 the facilities of the pipeline will undoubtedly open  
13 to increased fishing. The Game Branch is responsible  
14 for the sport fishery and can have no plans at all for  
15 special regulations given the present information base.

16 Our contingency plans, given  
17 the construction of a pipeline, sound like this. Should  
18 the pipeline be built across the Northern Yukon, the  
19 Game Branch wishes to respond by establishing three  
20 new permanent detachments in the north. The cost of  
21 this expansion plus basic staff will amount to about  
22 \$700,000 or about equal to the total present annual  
23 budget of the Yukon Game Branch.

24 This plan would put one  
25 detachment on the North Coast, one at Old Crow, and one  
26 on the Northern Dempster Highway. The detachments  
27 would have to be supplied with a basic enforcement  
28 staff and aerial support logistics. We envision tech-  
29 nical staff attached to each unit on a permanent or  
30 temporary basis, depending on location. The purpose of



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1 the technical staff would be to gather routine manage-  
2 ment data, implement management schemes, and assess  
3 their effects.

4 This plan must be considered  
5 in addition to the major research program which must be  
6 carried out initially to devise rationale for  
7 management, as described above.

8 In addition to this, we envision  
9 another semi-permanent staff whose responsibility it  
10 would be to assess the progress of construction. This  
11 staff would be assigned to the area of the route chosen  
12 and would involve itself directly with the special  
13 regulations and programs of actual pipeline construction.  
14 This staff would include at least one biologist and  
15 technician, plus a small enforcement staff. It would  
16 be supported by some additional form of aerial transport.  
17 This, we estimate, to cost about \$200,000 annually as  
18 long as it is needed. The total initial need for an  
19 appropriate response, including the three stages we  
20 have outlined, would be in the order of a million  
21 dollars.

22 Special regulations and  
23 responsibility of the managing body. In general, we  
24 feel that the issue of special regulations governing  
25 the pipeline construction itself and pipeline  
26 personnel has been adequately discussed before this  
27 Inquiry. Basically we wish to see pipeline personnel  
28 engaged in nothing outside of actually building the  
29 pipe. This includes a ban on all wandering from the  
30 site, hunting, use of vehicles for other than necessary





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trips and what have you.

An important feature of this regulation is that it must apply to all non-pipeline personnel -- persons who happen to be present on the site. The use of any of the pipeline-related facilities must involve the adopting of all the environmental safeguards.

On our part we are contemplating closing the entire Arctic Yukon to sport hunting for the time being. This would alleviate the pressure from this one source until our management program is well advanced. There are parts of the regulatory phase the responsibility of which we would like laid fully upon the applicant. This primarily involves policing their own personnel and associates. Nor are we particularly interested in watching the compliance with specific regulations relating directly to the pipeline construction. We favor an independent body formed solely for this purpose, perhaps by the Federal Government.

The role the Game Branch will perform is one of monitoring the wildlife populations during construction. The Game Branch will be the body responsible for carrying out management of wildlife in the future and we are most concerned that we develop our agency to the point where this is possible.

Obviously our monitoring role must be done in close liaison with the regulatory authority of the company itself and other government regulatory bodies. We would oppose any other agency assuming the role of monitoring wildlife populations



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1 on the basis that the Yukon Game Branch already has  
2 this responsibility and following construction of this  
3 first pipeline we must have developed our department  
4 to the point where we can carry on with management.

5 I want now to give two instances  
6 of response by the Game Branch to activity outside  
7 our normal capabilities of response to illustrate the  
8 philosophy that would seem most appropriate in the  
9 far north. The first is our present program in the  
10 Northern Yukon. It was forced on us by the developments  
11 in the north over the last few years as mentioned. In  
12 1974 we attempted to finance the program from our own  
13 budget and suffered an unacceptable over-run. In 1975  
14 the Department of Indian & Northern Affairs agreed to the  
15 necessity of our program and made a special grant to  
16 cover the major part of our expenses. In 1976 we will  
17 likely be able to handle the Old Crow program ourselves.

18 The second instance involves  
19 the Dempster Highway. The contract for the next segment  
20 of the road will include certain support to the Game  
21 Branch in order that we may carry out a biological moni-  
22 toring program on its effect on caribou. This support  
23 in the form of lodging, board and aircraft time, will  
24 be supplied by the contractor and by the proponent,  
25 according to the agreement between them.

26  
27  
28  
29  
30



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1 We point to the precedent this  
2 has set for new activity in the north. We trust this In-  
3 quiry has closely scrutinized the Alyeska agreement  
4 with the Alaska Department of Fish and Game in this  
5 regard. Where a land user moves into new country, open-  
6 ing it to access, certain responsibilities must be born  
7 with regard to the managing agency.

8 The pipeline response by this  
9 branch is, in our opinion an extraordinary situation  
10 requiring extraordinary input. We have demonstrated our  
11 inability to respond to booms and activity because  
12 of staff and budget limitations. The north coast  
13 expansion is a direct result of the pipeline construc-  
14 tion and, therefore, we feel the applicant should be  
15 prepared to fund our expansion as an integral part of  
16 his program.

17 Further, in this same regard,  
18 we feel that the guarantee of compliance to original  
19 intentions in the form of a bond should not be considered  
20 as the same as granting assistance to the managing body.  
21 In spite of the best <sup>of</sup> intentions of the applicant, there  
22 will always remain the possibility that damage may be  
23 incurred to the wildlife populations.

24 We cannot accept the premise  
25 that because the Game Branch was enabled to make the  
26 response it felt necessary, full responsibility falls  
27 on us for the wellbeing of the wildlife. Our prime  
28 role as far as the direct effect of the pipeline  
29 construction is concerned given the time frame contempla-  
30 ted, will undoubtedly be as a monitor, not as a preventer





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1 of change.

2  
3 The process of rebuilding  
4 wildlife populations can be very expensive and cannot  
5 be considered as a normal part of the responsibility  
6 of the managing authority. Considering the 12 or  
7 14 or whatever it is, million dollars, already spent on  
8 Gas Arctic on wildlife-related studies, it would not  
9 seem unfair to ask for a substantial performance guaran-  
10 tee.

11 This ends my testimony with  
12 the exception of a summarizing paragraph, which states  
13 that when new areas are open to access, wildlife popula-  
14 tions, notably those associated with open tundra, cannot  
15 continue without the application of management techniques.  
16 The managing body in the Yukon Territory is the Yukon  
17 Game Branch, which, given present capabilities will  
18 not be able to carry out the function of management in  
19 the northern Yukon for many years to come.

20 Our plans to meet the con-  
21 struction are basically to establish a three-part pro-  
22 gram of initial research, wildlife population  
23 monitoring during construction, and a continuing program  
24 of management and enforcement. To establish this program  
25 in the time frame which seems contemplated, we suggest  
26 the applicant has a responsibility for funding our  
27 expansion. We also suggest a guarantee of performance  
28 which could be used to repair damage to wildlife  
29 populations incurred during the pipeline construction.

30 MR. GOUDGE: Thank you Mr.  
Mossop.



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1 THE COMMISSIONER: Just before  
2 you go on, Mr. Mossop, you referred at page seven and  
3 in the pages following to certain instances of alpine  
4 animals that had virtually disappeared with the -- once  
5 the presence of man became established in the vicinity  
6 and on page eight, you referred to the case of Montana  
7 Mountain in the southern Yukon and you gave us the  
8 figures. You said a large Dall sheep population estima-  
9 ted at over 200 has been exterminated. You referred  
10 to the caribou, saying it was a famous caribou population  
11 hunted during migration, crossing the river at Carcross,  
12 I suppose.

13 Do you have any figures there?  
14 How many were there and how many <sup>are</sup> left; any idea?

15 A No, we have no figures  
16 on the original population. We have -- the evidence is  
17 in the form old photographs indicating that a very  
18 large harvest was taken from this herd and from oldtimers  
19 that, you know, talk of very large numbers of caribou.  
20 These were mountain caribou which migrated between the  
21 mountain ranges involved here and the present population  
22 is difficult to pin down. Our counts vary from five  
23 animals to up to 200, depending on the conditions.

24 Q Right.

25 MR. GOUDGE: Dr. Simmons, I  
26 wonder if we might move to you. Mr. Commissioner, we  
27 have distributed today, a copy of Dr. Simmons's evidence  
28 But, there are one or two minor changes which have been  
29 made from the testimony which was circulated some weeks  
ago, and for convenience, we circulated this copy today.



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Q Dr. Simmons, I wonder  
if you might commence, please, to read your evidence  
for the Commission?

WITNESS SIMMONS: First, I will  
give a historical sketch of the Fish and Wildlife  
Service to give you an idea of what type of organization  
we are. That'll give a framework for the rest of the  
discussion.

Unlike most fish and wildlife  
conservation agencies in North America, the management  
programs of the N.W.T. Fish and Wildlife Service are  
designed primarily to satisfy the food and psychological  
requirements of an indigenous people. It is a cliché  
in our profession that wildlife management is people  
management, yet nowhere is it more evident than in the  
N.W.T. where a majority are not far removed from living  
off the land.

The field personnel of the  
Service are organized into three regions and one  
district, as is the entire N.W.T. government; each super-  
vised by a superintendent. The regions and district  
are divided into areas, each of which is assigned one  
or more area fish and wildlife officers. The part of  
the N.W.T. that concerns this hearing is covered by two  
regions, headquartered at Fort Smith and Inuvik. For  
the past several years, those regions have been served  
by 22 officers as shown in Table 1, and maybe I could  
use that overhead projector.

Does that need focusing? It is  
an awful lot to read in a very short amount of time, but





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1 generally it gives you an idea of where our fish and  
2 wildlife officers are stationed and what communities  
3 they service. Some of them are -- one or two men  
4 are servicing quite a few communities in some cases.

5 There is another part to the  
6 table which you can put on at your convenience. It's  
7 just a continued list of the fish and wildlife officers  
8 and what communities they serve.

9 I should point out that nine  
10 of the officers are what we call Fish and Wildlife  
11 Officer I's. We used to call them patrolmen and they  
12 served mainly as interpreters, field assistants and  
13 maintenance men for the service. They have served in  
14 that capacity.

15 The Regional and District  
16 Superintendents report to the Superintendent of the  
17 Fish and Wildlife services. They are served by an  
18 advisory staff of specialists based in Yellowknife.

19 The Area Fish and Wildlife  
20 Officers (and I'll refer to them here in my text as  
21 AFWOs ) are responsible for the success of a variety  
22 of programs designed to assist N.W.T. residents, a maj-  
23 ority of whom are permitted by law to hunt, trap and fish,  
24 whenever and wherever they wish to obtain the maximum  
25 benefit from fish and wildlife on a sustained yield  
26 basis.

27 These officers administer loans  
28 and grants to trappers, support hunters and trappers  
29 associations, explore the fishery potential of lakes  
30 and streams, support organized caribou hunts, conduct



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1 trapper education courses, support the construction  
2 of basecamps for hunters and trappers, assist with the  
3 harvest of sea mammals, provide and maintain two-way  
4 radio communications with hunters and trappers and  
5 assist trappers with fur marketing.

6 The AFWO's also issue a variety  
7 of licenses and permits, maintain liaison with schools  
8 and with other agencies, conduct hunter safety courses,  
9 train new personnel and pursue the duties of law enforce-  
10 ment officers. Upon this considerable load is placed  
11 the task of conducting basic wildlife surveys, mainly  
12 designed to determine and monitor the seasonal distribu-  
13 tion and general abundance of mammals.

14 Staff specialists at Yellow-  
15 knife design and often conduct major management studies.  
16 For example, the specialists have supervised test  
17 fisheries in the Mackenzie Delta and eastern ARctic, and  
18 have designed and conducted longterm studies of bison,  
19 polar bear, grizzly bear and barren land caribou.

20 Staff specialists also cooperate  
21 through various committees and boards with habitat manage-  
22 ment agencies and, like the Yukon, we have no habitat  
23 management role. Habitat management agencies such as  
24 the Department of Environment and the Department of  
25 Indian and Northern Affairs design and recommend  
26 legislation governing the use of wildlife, provide  
27 administrative support to the field staff, design and  
28 supervise the new Outpost Camp Program, and respond to a  
29 myriad of demands, requests, complaints, and questions  
30 from an increasingly well-informed and outspoken public.



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1  
2 I guess we'll -- I guess what  
3 I'm trying to say is we're snowed.

4 Next, I'd like to discuss  
5 the expanding responsibilities of the N.W.T. Fish and  
6 Wildlife Service over and above what I've just discussed  
7 in the historical perspective.

8 As a result of the rapid ex-  
9 ploration and development of the north, particularly  
10 in the district of the Mackenzie, the responsibilities  
11 of the Fish and Wildlife Service are expanding faster  
12 than our ability to keep pace. Native organizations are  
13 more effectively explaining their needs to administrators  
14 who respond with improved and expanded programs such as  
15 hunters and trappers associations, and with new programs,  
16 such as our Outpost Camp Program and the marketing of  
17 sea mammal meat.

18 Improved transportation allows  
19 hunters and trappers to go further afield more efficient-  
20 ly, to drive new roads and trails, to land on new air-  
21 strips, and therefore to exert greater pressures on  
22 wildlife populations than wildlife managers may know --  
23 that wildlife managers may know little about.

24 Due to the great increase of  
25 mineral and petroleum exploration and development, the  
26 service must review more and more applications for  
27 land and water use permits and research permits to ensure  
28 that wildlife management concerns and the concerns of  
29 the user public are adequately considered. More  
30 transients in the north spell more wildlife law enforce-  
ment problems. More coordination in enforcement is





Monrop, ~~Simmons~~  
Stephen, Norton  
In Chief

1 required with conservation agencies in the Yukon and  
2 adjoining provinces.

3 The old Game Management  
4 Division has left the Department of Economic Develop-  
5 ment for the new Department of Natural and Cultural  
6 Affairs and has re-organized. It brought with it a  
7 fisheries development responsibility, and this has  
8 resulted in a name change. We're called the Fish and  
9 Wildlife Service now.

10 To clarify the following  
11 discussion, I'd like to identify or define several  
12 terms. An in-migrant, for the purpose of this discussion,  
13 is a person who moves into an area in response to a  
14 boom and becomes a resident. An in-migrant does not  
15 intend to stay in the N.W.T. after the exploration and  
16 development activity, which attracted him, declines.  
17 He will be the pipeline construction worker and the  
18 pilot flying for a pipeline firm, for example.

19 A native is an Indian, Inuit  
20 or Metis residing in the N.W.T. Of most interest to  
21 us is the fact that nearly all natives are entitled  
22 to hold general hunting licenses. (G.H.L.'s)

23 Non-natives are N.W.T. resi-  
24 dents not fitting the above categories. Most of them  
25 are not G.H.L. holders.

26 Population growth in the  
27 Mackenzie district. The growth in the non-native and  
28 in-migrant segments of the population of the N.W.T. have  
29 taxed our service most severely. The growth in the  
30 non-native population spells an increase in the demand



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1 for our services relating to recreational hunting and  
2 wildlife law enforcement. An example of the change in  
3 the workload of a station as a result of growth in  
4 the non-native population can be found in Yellowknife.  
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Monroe, ~~Simmons~~, Stephen, Norton  
In Chief

1                   The non-native population in  
2 Yellowknife doubled in the last decade. Table 2 shows  
3 the percentage of a 37½-hour work week as well as the  
4 number of man years that were spent at the Yellowknife  
5 station, and let's see.           I'm sure glad you have  
6 copies of that thing. The Yellowknife station by the  
7 way, consists of one fish and wildlife officer, I and  
8 one fish and wildlife officer, III, indicating the  
9 seniority of the individual. The number of man years  
10 that were spent at the Yellowknife station on a variety  
11 of tasks before the boom in the non-native population,  
12 the percentages of the same work week actually spent  
13 on the tasks now and the percentages of time we feel  
14 we should be spending on these tasks at present, and  
15 you can note in your table the marked deficiencies that  
16 are indicated in the areas of wildlife law enforcement  
17 and in the general office administration.

18                   The present workload is  
19 definitely an overload. An indicator of overload is  
20 the fact that the fish and wildlife officers are not  
21 available at their office four out of five days. They  
22 are generally out on patrol, mostly enforcement work.

23  
24                   The future growth of the in-  
25 migrant population will result in an even greater demand  
26 for enforcement services, as well as an increase in the  
27 administrative tasks such as licence and permit issuing  
28 and the handling of complaints about land use regulation  
29 violations. An example of what an increase in the in-  
30 migrant population may do to a station workload can be





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1 found in Fort Simpson, Table 3. One reflection of the  
2 increase in problems related to land use regulations  
3 alone is the increase in the Lands & Forest Service  
4 staff from 1 to 10, including support personnel, that's  
5 the Mackenzie Lands & Forest Service of the Federal  
6 Government. In the Fort Simpson area over the past  
7 eight years, including the creation of an expanded office  
8 at Fort Liard; a similar expansion has developed at  
9 the Inuvik Lands & Forest Service office (1 to 14).  
10 One person to 14 people, presently.

11 Note the range between the  
12 time -- note the range in the table, Table 3, between  
13 the time spent on enforcement duties before 1966, the  
14 time presently spent, and the estimated time our  
15 fish and wildlife officers should spend for proper  
16 performance.

17 Now I'd like to discuss the  
18 delta area as an example. I am best prepared to discuss  
19 our service's response to a rapid increase in exploration  
20 and development in the Mackenzie Delta area, mainly  
21 because of our recent participation in the Mackenzie  
22 Delta Regional Planning exercise, of which I think most  
23 of you are aware.

24 There was an average 6.5% annual  
25 growth in population in the delta area between 1961 and  
26 1971 (that is native and non-native residents). Between  
27 1966 and '76, the N.W.T. Fish & Wildlife Service did  
28 not respond to this growth by a proportionate increase in  
29 staff. In 1966, one officer served 650 people; in 1971  
30 one officer served 787 people; and presently one officer



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serves 921 residents.

This is a basic indicator of an increase in workload. Figure 1 is a projection of Mackenzie Delta population growth, assuming construction of a gas pipeline, sub-divided into native, non-native, and in-migrant categories. It shows the native population increasing at a slightly greater rate than the non-native resident population. It reflects in the sharp increase of the in-migrant numbers, the tempo of mineral, gas, and oil exploration in the delta since 1971, and the expected fluctuations of in-migrant numbers as a result of gas pipeline construction. The increase in the native population growth in itself may not seriously overload our service at its present rate of expansion. The demands placed on our service by natives may well be balanced by a decline in subsistence hunting and trapping.

The delta area now has the combined management problems that both Yellowknife and Fort Simpson have. They have a relatively large non-native population. That impact was given as an example from Yellowknife, and a large in-migrant population like Fort Simpson has, and I have a foot-note here that an indicator of the in-migrant and transient population activity in the delta is the number of arrivals from the south on P.W.A. from 7,000 in '66 to about 43,000 in 1975. This was taken from a report by McNeal, Hildebrand & Associates in 1975.

The greatly increased workload and the comparatively large percentage of time spent





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on enforcement is evident in Table 4, for the delta.

The reasons for the performance work short-comings and overload in the delta area are complex, involving such things as a marked increase in inter-settlement movements by residents, vandalism, theft, a greatly increased incidence of reported man-bear conflicts. More recently, F.W.O.s in the delta have become increasingly involved with various committees and meetings having to do with land use activities. The Pipeline Inquiry, regional planning, offshore oil & gas exploration, native hunter and trapper concerns related to oil and gas exploration, briefings of political organizations such as COPE, provision of information to a multitude of scientists in the area, and the need to maintain good working relationships -- relations with more and more public and private agencies in a boom atmosphere. One of the above reasons for work overload can be easily quantified -- polar bear-man conflicts. This winter fish and wildlife officers in the delta have spent 19% of their working days visiting rigs to try and help solve their problems. Between the winters of 1973-74 and '75-76 the number of field trips increased by 15, 10 to 25, and the number of man days spent on these trips increased by 21, from 32 to 53. This increase was due largely to polar bear-man conflicts. A corresponding reduction in field trips related to hunter and trapper activities has resulted. By causing the diversion of the attention of our F.W.O.s to the problems sketched above, most of which are related to non-native and in-migrant activities,





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1 the quality of performance must suffer unless both  
2 manpower and budgets are increased. What pains us most  
3 in the delta is our increasing inability to work closely  
4 with the native resource user, and our inability to  
5 re-establish and maintain a good rapport with the general  
6 public, including the in-migrant, through education  
7 programs. Now education begins at the area office  
8 which now must, in the delta must remain closed four out  
9 of five days. That is in Inuvik, so that the F.W.O. can  
10 attend to an increased enforcement load.

11 MR. GOUDGE: Sir, I wonder if  
12 you might pause there? Sir, I note that it's 5:15 and  
13 I wonder whether it might be an appropriate place to  
14 break today, and Dr. Simmons could carry on in the  
15 morning?

16 THE COMMISSIONER: Well, maybe  
17 we should just continue and let Dr. Simmons finish  
18 his statement. We're sort of into it mentally and  
19 -- is that all right?

20 A Sure.

21 MR. GOUDGE: Sorry. Carry on.

22 A Where in the heck was I?  
23 Oh yes. I'd like to take up the projected management  
24 study manpower requirements, that is the manpower  
25 requirements we feel we will need in the future to con-  
26 duct the necessary management studies in the delta  
27 area. Table 4 indicates that the time devoted to  
28 management studies in the delta should be increased to  
29 1½ times that presently devoted to this task. For the  
30 area fish and wildlife officer, management studies



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involve routine surveys such as aerial, beaverlodge counts,  
ground searches for polar bear dens, and location of  
sheep winter ranges. Initial direction for these  
surveys often comes from staff specialists in Yellowknife.  
The design and conduct of longterm management studies  
is the responsibility of the management study section  
at the Yellowknife headquarters.



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The existing and projected man/year requirement for the services of the Management Studies Section in the delta area is shown in Figure 2 as that area above the 0.3 man-years normally expended on management studies by Area Fish and Wildlife Officers. The prediction takes into account the research conducted by the Canadian Wildlife Service and numerous consulting firms and universities working in the delta. In the future, most of our management studies will be relatively short-term (one to three years) and will deal with specific problems of direct management applicability.

In Figure 2, we have projected our man/year requirements and this excludes management studies related to oil exploration and development in the Beaufort Sea; that is, it is not shown on the graph--our man year requirements if a gas pipeline is not under construction before 1979 or 1980 and our requirements for management studies if such construction begins before then. Our step-up in management studies should begin at least a year before construction starts. The management studies will involve determinations of general abundance and seasonal distribution of large mammals and furbearers, the monitoring of hunter kill, and the productivity and survival of large mammals. There will also be the task of monitoring the interaction between men, machinery, and wildlife populations, and the task of reviewing large numbers of water and land use applications and recommending research to fill in gaps in knowledge.





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Project -- excuse me, a projection of requirements for Fish and Wildlife Officers assuming a pipeline is constructed.

We made rough guesses of our FWO requirements for the next 8 to 10 years using 1966 as a baseline and this is when we were serving mainly native and non-native residents and not a large percentage of in-migrants. We assumed that the 1966 ratio of 1 Fish and Wildlife Officer to 650 people permits the Fish and Wildlife Officer to perform adequately while working no more than an acceptable level of 15% overtime. This ratio was then used with total population projections for the delta to arrive at one set of manpower estimates shown in Figure 3.

This is dreadfully dull, how we have developed this graph up there. We tried to arrive at projections by three separate routes to kind of test ourselves on this and then I'll plod through what we did if you will bear with me.

Using the change between 1966 and 1976 as a baseline, similar ratios were calculated correlating the increase in the number of transients with the increase in the workload of the FWO station. These ratios are also plotted in Figure 3 to determine if they differ significantly from the curve based on total population. All three ratios produce similar curves.

The projected points were plotted for in-migrants and transients using the



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1 data in Table IV. Assuming that a 15% overtime load  
2 can be handled without difficulty, we can then estimate  
3 that our present staff of FWO's should now be 180%  
4 of what it was in 1966 and it was -- at that time  
5 it was 6 Fish and Wildlife Officers and it still was  
6 that in 1976 or about 11 Fish and Wildlife Officers as  
7 a projected need. These figures (6 and 11) were then  
8 used with the estimated numbers of in-migrants  
9 and the forecasted numbers of transients to come up with  
10 formulae for the points in Figure 3 that are  
11 comparable with the points derived from the 1/650 ratio.  
12 And we assume that the number of transients is indicated  
13 by the number of Inuvik passenger arrivals on P.W.A.  
14 It's pretty rough.

15  
16 Our somewhat educated guess then  
17 using three criteria, is that we will need 15 to 18  
18 Fish and Wildlife Officers, plus administrative support  
19 staff, adequate budgets, and sufficient equipment, to  
20 adequately perform our duties in the delta area by 1980.

21 Recommendations -- The tables  
22 and graphs and questionable statistics should serve only  
23 to give some scale to an obvious conclusion: we must  
24 grow as an agency to meet the increased demands for our  
25 services that will result from pipeline construction  
26 and all the related development and exploration that  
27 will accompany such a giant project. What we have  
28 demonstrated, however crudely, is that the rate of  
29 growth of our service in the Mackenzie District must  
30 be greatly increased if we are to cope with the problems





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1 that such projects are bringing and will bring.

2 We cannot cede any of our  
3 responsibilities of wildlife management, including  
4 monitoring, enforcement, public education, and management  
5 studies, to another agency or central authority. The  
6 wildlife species and the natives who depend upon them  
7 cannot be confined or excluded by the boundaries of a  
8 development corridor; therefore our management  
9 responsibilities cannot be effectively excluded from  
10 the corridor.

11 Our responsibility to manage  
12 wildlife in the N.W.T. is defined in the Northwest  
13 Territories Act and in the N.W.T. Game Ordinance. This  
14 Ordinance and the game regulations, which are presently  
15 under review, must be altered to reflect the rapidly  
16 changing northern scene. A most obvious requirement  
17 for change is to the definition of a resident sport  
18 hunter as a person who has resided in the N.W.T. for  
19 6 months.

20 We were considering proposing  
21 a two-year residency requirement before a sport  
22 hunter can purchase our sport hunting licence.  
23 Furthermore, our regulations governing the use of  
24 firearms in exploration camps. The use of aircraft  
25 while hunting -- fixed and helicopters both. The  
26 protection of so-called nuisance wildlife: bears,  
27 wolves, foxes, for example. The sale of trophies;  
28 especially Dall sheep horns, the waste of meat, and  
29 even the penalties for infractions of our regulations  
30 must be changed to be effective.





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1 They are long out-dated,  
2 obscure and a source of frustration to our officers and  
3 the public alike. New regulations must be drafted to  
4 govern access to wildlife from roads and trails of the  
5 company exploration and development. Particularly  
6 where roads and trails cross through especially sensitive  
7 areas such as alpine and barrenland tundra.

8 Our regulations must be  
9 drafted in coordination with the Yukon Territory and  
10 the adjacent provinces, since wildlife populations  
11 fail to recognize the political boundaries.

12 Furthermore we must  
13 become involved with a coordinated environmental  
14 management plan in the Mackenzie Valley rather than the  
15 unwieldy scheme in use today. Thank you.

16 MR. GOUDGE: Thank you, Dr.  
17 Simmons. Perhaps, sir, we could break now. Before  
18 we rise today, sir, I think it ought to be noted that  
19 Mr. Marshall is leaving tonight for Calgary and I  
20 understand that he may not be back since he transfers  
21 his expertise to another forum which is embarking upon  
22 a consideration of this Inquiry -- of this Application --  
23 that we began some 21,000 pages ago.

24 We were trying to devise some  
25 appropriate designation of that and we thought of the  
26 G.L. Williams Award for durability since Mr. Marshall  
27 has outlasted Mr. Brackett, Mr. Goldie, Mr. Krieber  
28 and Mr. Genest but we can't give it to him because he  
29 is now leaving. But I think we should say, sir, that  
30 despite what has become a steady stream of often testy



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1 objections from Mr. Marshall, we nonetheless wish him  
2 well in his new forum as we are going to miss him.

3 MR. MARSHALL: Thank you very  
4 much, Mr. Goudge. Mr. Commissioner, as of tomorrow  
5 Mr. John Steeves will assume my duties before the  
6 Inquiry and I assure you, sir, that my departure is in  
7 no way related to your ruling this afternoon of the  
8 admissibility of Mr. Nicol's evidence.

9 The immediate impetus  
10 is of a domestic nature in that my wife and I are  
11 expecting the arrival of our third child we hope  
12 momentarily.

13 . The other reason is that  
14 having been educated through the efforts of my learned  
15 friends as to the relative strengths and weaknesses of  
16 the Arctic Gas and Foothills cases respectively I  
17 have been asked to assist Mr. Goldie in the hearings  
18 before the National Energy Board which are due to  
19 start April 12th.

20 I have enjoyed the past  
21 year with the Inquiry very much, sir, and I thank you  
22 for your patience and cooperation throughout. And I  
23 would like to thank as well your staff, particularly  
24 Miss Hutchinson whose courtesy and helpfulness I  
25 have valued. Finally I would like to express my thanks  
26 to my fellow counsel as I have enjoyed having had this  
27 opportunity to work with and against them over the  
28 past year. They have taught me I hope a great deal.

29 Least Mr. Bayly get  
30 carried away, sir, I should warn that I may return on





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1 occasion to Yellowknife and I'll maintain my membership  
2 in the Northwest Territories Bar Association. I'll do  
3 my best to follow the scene at least some of the  
4 southern hearings of the Inquiry.  
5

6 Mr. Steeves, is, I believe  
7 well known to you as he is a member of the B.C. Bar  
8 and he has been here at the Inquiry at the early stages.  
9 I'm certain you will find him of great assistance to  
10 you throughout the balance of the hearings. Mr. Carter  
11 will, of course, be here to assist Mr. Steeves. I  
12 therefore ask, sir, your leave to withdraw.

13 THE COMMISSIONER: Well, Mr.  
14 Marshall, you certainly have my leave to withdraw and  
15 I -- because of these impending events within your family  
16 we're most anxious that you should get away in time  
17 to be present for these occurrences which seem to be  
18 frequent and regular in your family but we all  
19 congratulate you.

20 Let me just say, Mr.  
21 Marshall, it has been a pleasure for me to have you  
22 representing Arctic Gas at the hearings and I know I  
23 speak for all of counsel when I say we admire your  
24 grasp of the material and your incisive approach to  
25 argument and to cross-examination. If I may be permitted  
26 to say so, I think we have all seen your capacity as  
27 a lawyer develop enormously /during the months that have  
28 passed since Mr. Genest left you in charge on the bridge  
29 and I know you will be of great assistance to Mr.  
30 Goldie. I suggest though you should have stayed with  
us because I think we may finish before the National





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1 Energy Board and we -- but maybe they need you more  
2 than we do -- I don't know. Let me just say that I  
3 certainly am going to be sorry to see you go, notwith-  
4 standing an acquaintance of long standing with Mr.  
5 Steeves and we all wish you well and we know that the Board  
6 which has had its difficulties will be well served by your  
7 presence there. So I guess it is time to adjourn until  
8 another day, tomorrow, 9:30.

9  
10 MR. MARSHALL: Thank you.

11 (PROCEEDINGS ADJOURNED UNTIL APRIL 6, 1976)  
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